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The Northern pacific railroad,
sketch of its history ... 1882

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THE GREAT



NORTHERN PACIFIC

CROSSES THE

BEST ZONE

BETWEEN THE

GREAT LAKES



AND THE

PACIFIC OCEAN.

GEORGE DEW,
NORTHERN PACIFIC R. R.
THE
72 YONGE ST.

NORTHERN PACIFIC RAILROAD.

SKETCH OF ITS HISTORY : DELINEATIONS OF THE DIVISIONS OF ITS TRANS-
CONTINENTAL LINE : ITS FEATURES AS A GREAT THROUGH ROUTE
FROM THE GREAT LAKES TO THE PACIFIC OCEAN : ITS RELATIONS
TO THE CHIEF WATER WAYS OF THE CONTINENT,

AND

A DESCRIPTION OF THE SOILS AND CLIMATES
OF THE REGIONS TRAVERSED BY IT AS TO THEIR ADAPTABILITY TO
AGRICULTURAL PRODUCTION.

WITH

DESCRIPTIVE AND STATISTICAL EXHIBITS OF THE COUNTIES
ON AND NEAR ITS LINE IN MINNESOTA AND DAKOTA.

FOR THE INFORMATION OF THOSE SEEKING NEW HOMES AND PROFITABLE INVESTMENTS.

BY A MEMBER OF THE CHICAGO PRESS.

CHICAGO :
RAND, McNALLY AND COMPANY, PRINTERS.
1882.

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THE NORTHERN PACIFIC RAILROAD.

OUTLINE OF ITS HISTORY.

In 1853, 1854 and 1855, an expedition of officers and men under the lead of Gov. Stevens, commissioned by the United States Government, made an exploration of the countries lying variously between the 47th and 49th parallels of latitude, to determine the practicability of a route for a railroad from the Great Lakes and the Upper Mississippi to the waters of Puget Sound. The scope of the exploration included, among other data, the characteristics of the intermediate regions, then very indefinitely known, or wholly unknown, as to their adaptability to agricultural pursuits, their water supplies, their mineral, timber, and other resources, and their conditions in general for the maintenance of a civilized and progressive population. The official report of the expedition confirmed the truly national character of such an enterprise as the Northern Pacific, brought prominently into view its advantages in respect to distances as a route of travel and commerce, its greater proximity to Asia, its shorter distance between great water lines, its greater proximity to Europe, and the fact that it was much the shortest and most direct route between Asia and Europe. It also established the fact that by the Northern route were the easiest gradients, the least and fewest engineering difficulties, and that there existed an abundance of wood, water, and materials of construction. With respect to the general resources of the countries to be traversed by the proposed line, for the support of a compact population, the elaborate reports of the expedition presented the strongest confirmatory proofs. Except at the crossings of the mountain ranges, the entire route was found to pass through a succession of fine, arable lands—countries extraordinarily well watered by large rivers, many important confluent and numerous tributary streams—and covered with a vegetation which plainly indicated the richly productive capacity of their soils. The climate was shown to be universally superior in the qualities which assure healthful and pleasant living, generally favorable for the production of crops, and often more propitious than elsewhere found for the growth of wheat, oats, rye, barley, and the vegetables.

Supported by these well ascertained facts, the enthusiastic friends of the Northern route confidently sought the aid and encouragement of the Government. By Act of Congress, approved July 2, 1864, a large number of corporators were created a body corporate and politic, styled the Northern Pacific Railroad Com-

pany, who were empowered to build a railroad from Lake Superior to Puget Sound on a line north of the 45th parallel. The Act granted a right of way through the public lands, and in aid of construction absolutely donated to the company the alternate odd-numbered sections of public lands lying within ten miles on each side of the line through the States, and within twenty miles on each side of the line in the Territories.

The Act provided that the incorporators named should constitute a Board of Commissioners who should, on a called day, assemble in Boston and effect an organization by the choice of a president and other officers. The Board of Commissioners were directed to open books for subscription to the capital stock of the company, and when 20,000 shares had been subscribed for, and ten dollars paid in cash on each share, to call a meeting of stockholders for the election of thirteen directors of the company.

The first set of directors was elected Dec. 6, 1864, and on the following day organized by the election of Josiah Perham, President, and by the choice of a Vice-President, Secretary and Treasurer.

Mr. Perham and his associates were not men of practical experience. They proposed to raise \$100,000,000 by the subscriptions of a million individuals, whom they believed could be found willing to take one share of stock each at par, and thus build the road. The scheme, of course, failed. The next set of directors, two years later, headed by J. Gregory Smith as President, memorialized Congress to the effect that the land grant being mainly located remote from the then settled portions of the country, and little known to the public, had, with the many other favorable provisions of the charter, proved insufficient to induce capitalists to embark in the enterprise; more particularly so because other roads to the Pacific were able to offer not only their land grant security, but also the bonds of the United States. The memorialists solicited similar aid for the Northern Pacific in Government bonds. Congress finally failed to adopt legislation authorizing aid in Government issues, and in May, 1869, and January, 1870, the Northern Pacific Company, then controlled and directed by a combination of the best railroad experience and general ability and wealth in this country, consisting of such men as J. Edgar Thompson, President of the Pennsylvania Railroad, Thomas A. Scott, its Vice-President; William B. Ogden, President of the Chicago & North-Western; J. G. Smith, of the Vermont Central; George W. Cass, of the Pittsburg & Fort Wayne; B. P. Cheney, of Boston, and William G. Fargo, of Wells, Fargo & Co., made a contract with Jay Cooke & Co., then become eminent in finance by their success in negotiating the war bonds of the Government, to act as the fiscal agents of the Northern Pacific.

Under the financial direction and control of Jay Cooke & Co., which lasted till the fall of 1873, \$30,000,000 of the company's bonds were negotiated, bearing $7\frac{3}{4}\%$ per cent. interest, in gold. During the same period there were completed and put in operation 555 miles of road, viz.: the Minnesota Division, from Thompson Junction to Fargo, 230 miles; the Dakota Division, from Fargo to Bismarck, 195 miles; of the Pacific Division, 105 miles from Kalama to Tacoma; also, jointly, with the St. Paul & Duluth Railroad, the line from Thompson to Duluth, 25 miles.

In September, 1873, the house of Jay Cooke & Co. suspended—a memorable event, which precipitated a general financial revulsion, a sudden and enormous contraction of prices and values which had obtained in the period of extravagance

and inflation engendered by the war debt and the paper issues of the Government. The failure of Jay Cooke & Co. involved the speedy bankruptcy of the Northern Pacific.

Two years were required to complete the readjustment of the company's affairs. The foreclosure of its mortgage was initiated by the Trustees, with the concurrence of parties in interest, April 16, 1875, and a receiver appointed by the court. Later, during the same year, the entire property was sold under decree of foreclosure, and purchased by a committee of the bondholders. The reorganization was perfected, and a new Board of Directors elected, September 29, 1875. The Directory was organized by the election of Charles B. Wright, President; George Stark, Vice-President; Samuel Wilkeson, Secretary; and by the choice also of Treasurer and General Counsel. In May, 1879, Mr. Wright, for reasons of health, resigned the Presidency of the Northern Pacific, which he had held for more than three years, and was succeeded by Frederick Billings. During the incumbency of Mr. Wright in the office of President, the general financial condition of the country, and the difficulties opposed to extension into Montana by continued Indian hostilities, had long rendered the recommencing of construction across the continent impracticable. Important renewals, improvements and betterments in road bed, track and equipment of the operated line had, however, been made. Also, a branch line had been built 64 miles from Brainerd to a connection with the cities of St. Paul and Minneapolis at Sauk Rapids, and 31 miles had been added from Tacoma to Wilkeson, on the Pacific coast. It was not until the closing months of Mr. Wright's administration, in January, 1879, that the active work of construction was renewed by the commencement of grading operations west of the Missouri river.

Mr. Billings continued to be President of the company for two years, or until May, 1881, when he resigned the office. On the date of Mr. Billings' resignation the Missouri Division was completed about 150 miles, to the Little Missouri; the first 100 miles of which had been accepted by the Government, and the last 50 miles accepted conditionally upon certain improvements required by the Government Examiners. The Pend d'Oreille Division, beyond the Rockies, had also been graded a distance of about 100 miles, and a few miles of track had been laid. The Casselton Branch had been completed to Elm river, 31 miles, and grading commenced on its continuation to Goose river.

Mr. A. H. Barney temporarily succeeded Mr. Billings to the Presidency, with Mr. T. F. Oakes, Vice-President, until the next regular meeting of the stockholders, when, at the organization of the Directory immediately following, Mr. Henry Villard was elected President, and Mr. T. F. Oakes was re-elected Vice-President. During the season of 1881, and throughout the present favorable winter, the work of construction has been vigorously expedited. The condition of construction at the date of writing, February 10, 1882, is as follows: The Missouri Division has been completed 217 miles to Glendive, its western terminus, and has been accepted by the Government. This division is now permanently complete, with the exception of the temporary crossing of the Missouri river at Bismarck, where a magnificent high steel bridge is now being constructed, which will be finished on or before July 2, 1882. Of the Yellowstone Division, the road for 33 miles west of Glendive was accepted by the Examiners last appointed by the President of the United States. Since that date, this division is completed to the mouth of the Little Rosebud, 80 miles west of the point where last accepted by

the Government, and 113½ miles west of Glendive. The Yellowstone Division is substantially graded 150 miles beyond the Little Rosebud, and on June 1, 1882, the track will reach Coulson; on August 1, will be at Benson's Landing, and on October 1, will be laid to or near Bozeman, on the eastern slope of the Rocky mountains. The Pend d'Oreille Division has been completed and accepted by the Government for a distance of 225 miles northeast from Wallula, in Washington Territory, and has been extended a further distance of 25 miles. Contracts have been let for clearing the route from timber, from the last designated point to Missoula, over the Clark's Fork Division and western portion of the Missoula Division, a distance of about 200 miles. The remainder of the Pacific Division from Kalama to Portland, Oregon, is being constructed, and will be completed during the coming season. The completion of the portions of route indicated west of the Rockies, will give a continuous line from Missoula, Montana Territory, to Puget Sound, via the Oregon Railway & Navigation Company's Railroad, on the south side of the Columbia river, between Wallula and Portland. Work on the Rocky Mountain Division, in Central Montana, is being rapidly pushed. Contracts for the tunnels at the Mullen and Bozeman Passes of the mountains are let, and the boring of each is rapidly progressing. The contract for the remainder of the Rocky Mountain Division will be let soon, and on its completion in the season of 1883, the last gap will be closed in the continuous rail line of the Northern Pacific from Lake Superior to Puget Sound. At the close of 1881, the track was laid from Thompson to Superior, thus giving the Northern Pacific double outlet to Lake Superior, and completing the western portion of the Wisconsin Division, which is about to be extended to the Montreal river.

DIVISIONS OF THE NORTHERN PACIFIC MAIN LINE.

THE PACIFIC DIVISION

Of the Northern Pacific is a line running north and south between Portland, on the Columbia river, and Tacoma, on Puget Sound. It thus connects the Northern Pacific main line, in the eastern part of Washington Territory, with Puget Sound by way of the Oregon Railway & Navigation Company's line, traversing the south side of the Columbia river, from a connection with the Pend d'Oreille Division of the Northern Pacific to Portland. The Pacific Division is 147 miles in length. It forms no part of the direct through route between the Pacific Ocean and Lake Superior, as originally projected.

COLUMBIA RIVER DIVISION.

As referred to above, the Oregon Railway & Navigation Company have completed a line of railroad from Portland to Wallula via the south side of the Columbia river. The Columbia River Division of the Northern Pacific, along the north side of the river, would practically parallel the former line, and the construction of this division is at present rendered unnecessary, a favorable contract for the use of the Oregon Railway & Navigation Company's line to Portland having been consummated. The distance from Portland to Wallula is 210 miles.

THE CASCADE DIVISION

Will, when completed, be the direct main line of the Northern Pacific from Puget Sound to a connection with the Pend d'Oreille Division at Ainsworth. The west part of the line crossing the Cascade range will pass through and develop coal and iron fields of great value. The basin of Puget Sound—a great valley—is largely covered with immense forests of fir and cedar, and other timber, adapted to all the requirements of man. The east half of this division will pursue a course down the very fertile valley of the Yakima river. Its entire length will be about 190 miles.

THE PEND D'OREILLE DIVISION,

From Wallula to the north shore of Lake Pend d'Oreille, in Northern Idaho, was, during the last year, completed and put in operation. This division is built in a northeast direction from Ainsworth to avoid the westernmost range of the Rocky mountains—the elevation of Cabinet Landing, on the northern spur of the range at the eastern extremity of Lake Pend d'Oreille, being but 2,066 feet above the sea. The Pend d'Oreille Division pursues the valley of the Columbia for a short distance, crossing and following the valleys of several other streams on its route through one of the best watered and most productive districts of Washington Territory. The length of this division is 240 miles.

CLARK'S FORK DIVISION.

The Clark's Fork Division is now under construction along the Clark's Fork of the Columbia river, from Lake Pend d'Oreille to Clark's Fork, a distance of 150 miles. The line of the Clark's Fork Division is for the most part located through a region of abundant and magnificent timber, many of the trees being from seven to ten feet in diameter and of great heights. The varieties are red fir, white pine, white cedar, hemlock, tamarack and larch. The country along the route, when made accessible by the construction of the Northern Pacific, will quickly attract settlers, to whom its timber alone will be an important source of wealth. The soil of the Clark's Fork valley is a rich vegetable loam, covering deep alluvial deposits. On the hillsides is a similar surface soil, with a subsoil of disintegrated lava. On Thompson Prairie, about 75 miles from Cabinet Landing, have been the only attempts at agriculture thus far undertaken. Here there has been uniform excellence of production, large crops of wheat, rye, potatoes and other vegetables. The capabilities of soil generally along this portion of the line are unquestionable. Many beautiful mountain streams are crossed by the Clark's Fork Division, the water of which is of exceeding freshness and purity. Rapids and falls are also of frequent occurrence, and will be utilized for manufacturing purposes by the future settlers.

THE MISSOULA DIVISION

Extends from Clark's Fork to Frenchwoman's Creek, a distance of 160 miles. Grading has already been completed on portions of the line, which for a considerable part follows the Missoula and Hell Gate rivers. At points along the Missoula Division are outcrops of excellent lignite, and permanent veins of great value will, it is believed, be developed. On this division commences the great mineral belt of the Rocky mountains, and in the districts adjacent to its eastern end, and in the mountain regions, crossed by the west portion of the

ROCKY MOUNTAIN DIVISION,

Will be witnessed the next great development of mining industries in the history of the precious metals within the domain of the United States. In Montana, destitute of railway transportation, only the very high grade ores have heretofore been available, and exploitation itself has been very limited, and superficial and imperfect where attempted. However, as is well known, many prosperous mining camps exist, as an example of which may be mentioned, Butte City, a very thriving camp, having a population of about 7,000. At this point some 250 lode claims have been patented, many of these being as yet but little improved, but of which 25 are now yielding large profits, aggregating monthly a sum of \$300,000. The number of stamps at work in Butte City is 200; ten furnaces are in constant operation, and others are in course of construction. The mines of the Helena and Boulder districts are quite as extensive and valuable as those of the Butte district. The completion of the main line of the Northern Pacific and the prompt construction of branch lines, as required, will soon provide an available market for the medium and low grade ores, and stimulating improvement and discovery on every hand, will, as indicated by abundant evidence, vastly and progressively swell the yield of wealth from the great mineral deposits of the surpassingly rich territory of Montana.

Descending from the Mullen Pass of the great range of the Rockies, which, by the tunnel now being driven, from 3,500 to 3,700 feet in length, will be crossed at an elevation of less than 6,000 feet above the level of the sea, the Rocky Mountain Division of the Northern Pacific soon enters the country of the Upper Missouri river, meeting on the route the valleys of the four forks of the Missouri—the Jefferson, Madison and East and West Gallatin rivers. These valleys are among the most populated districts of Montana, are perfectly watered and exceedingly productive, and will rapidly become compactly settled when brought into communication by the Northern Pacific. East of the valleys named, the Bozeman Pass is crossed at about the same elevation as that of the Mullen Pass. The length of the Rocky Mountain Division from Frenchwoman's Creek to the crossing of the Yellowstone river, near Benson's Landing, is 150 miles.

YELLOWSTONE DIVISION.

The Yellowstone Division follows the valley of the Yellowstone river from its crossing near Benson's Landing to Glendive, a distance of 338 miles. The upper valley is of irregular width, broadening to an expanse of miles in places, and is occupied as far as Huntley, the head of steamboat navigation on the river, by frequent farms, which produce large, often extraordinary crops. From a point, not yet precisely determined, on this section of the line is projected, and will, during the present year be constructed, a branch to the renowned Yellowstone Park, the immensity of whose physical characteristics has never been adequately described. These are such as very rarely elsewhere exist, and are found in nothing like equal degree anywhere else in the world. They present to the wonder-struck spectator the varied grandeurs of the most profound and majestic mountain scenery, with the great geysers superadded.

For the greater part of its length the Yellowstone valley is of the average and generally regular width of about three miles. It is intercepted on the south by the important confluent of the Clark's Fork, Big Horn, Rosebud, Tongue and Powder rivers, and by numerous smaller streams from the north. With the

exception of occasionally more rugged bluffs between Miles City and Glendive, the slopes and summits of the adjacent hills and mountains enclosing the valley are uniformly smooth, and heavily covered with grasses. The rich soil of the Yellowstone valley and the valleys of tributary rivers is everywhere indicated by the growth of the greasewood and bitter sage, which require the support of a strong and abundant fertility. At the very infrequent points between Huntley and Glendive, a distance comprising nearly the whole of this division of the Northern Pacific, where agriculture has been attempted, it has been remarkably successful, and this without artificial irrigation. These broad bottoms constantly present to the eye wide, extending faces, having gentle inclines of remarkable beauty, while from frequent points of view the more distant and bolder bluffs group themselves into striking and picturesque contours.

THE MISSOURI DIVISION.

From Glendive—the point where the line leaves the Yellowstone, 50 miles west of the Dakota boundary—to Bismarck on the Missouri river, is the Missouri Division of the Northern Pacific, having an entire length of 221 miles. This section of the road, with the exception of the Bad Lands of the Little Missouri, about 25 miles in width, and the similar very broken formation of country contiguous to the Yellowstone river at and near Glendive, passes through districts the soil of which is of great natural force and fertility, and where in the western march of settlement will be developed fields not less remarkable for production than those of Eastern Dakota. The general face of the country from the Bad Land country to the vicinity of the Missouri river is intercepted by a system of mounds and buttes of more or less abrupt declivities. Interlying broadly between these are gently graduated slopes, wide sweeps of level and extensive basins, cut by several important tributaries of the Missouri, of which the Heart river is contiguous to the line for the greater part of its length. On these, and on the here and there rich, broadening bottoms of the rivers, will soon be seen fields of abundant wealth.

THE DAKOTA DIVISION

Extends from Bismarck to Fargo on the Red river, which forms the boundary between Minnesota and Dakota. The length of this division is 195 miles. Leaving the more broken but narrow strip of country bordering the Missouri on the east, the regions along the entire line to the valley of the Red river, with the single exception of the low chain of the Coteaus, and for a far distance south, and north to the British boundary, are undulating upland prairies, having no stratified rock, but exhibiting on their surfaces the scattered foreign boulders of the glacial period. This great scope of country is traversed in its western portions by frequently occurring tributaries of the Missouri; in the northwest by the circuitous Souris or Mouse river and branches; centrally by the Dakota or James river and the Sheyenne, with their branches, and on the east by the numerous streams flowing into the Red river. The valleys of these rivers are narrow and not very deep depressions, not often exceeding from a half mile to a mile in width. The soils throughout the vast tracts indicated are alike in character and qualities, possessing a peculiar and wonderful abundance of the elements of cereal growth, and having a deep and strong re-enforcing subsoil. Both soil and subsoil, in the constituents which afford a rich and permanent cereal production, are closely similar to those of the now famous Red River valley. The west half of the Red River valley, widening on the north, is, where the line crosses it, about 25 miles in width.

THE MINNESOTA DIVISION.

The first 25 miles of this division crosses the east half of the Red River valley. Thence, the line enters at once a fertile prairie country, and soon meets the western skirtings of the great timber belt of Minnesota, traversing a section which has been denominated the Lake-Park region of the State. The numerous attractive lakes of this part of the State are surrounded by ample groves, frequently uniting when the lakes are in close neighborhood, and forming continuous strips of timber of varying width. East of Motley, 136 miles from Duluth, the line runs through a very dense growth of timber extending all the way to Thompson, the end of the division, 22 miles west from Lake Superior. Among the many varieties of timber the pine greatly predominates. The immediate vicinities of the line have been overrun by fire at some former period, and here the growth is too small to furnish lumber; but for wide distances north, and to some extent on the south, there are large forests of full growth pine. The length of the Minnesota Division, from Fargo to Thompson Junction, is 230 miles. From Thompson Junction to Duluth, 22 miles, the line is owned and operated in common by the Northern Pacific and the St. Paul & Duluth Railroads. At Brainerd, a point on the main line 114 miles west of Lake Superior, the Northern Pacific has an important branch to St. Paul and Minneapolis, and there connects with the system of railways to Chicago and St. Louis.

THE WISCONSIN DIVISION

Extends from Thompson Junction to Superior, at the head of Lake Superior, 25 miles; thence to Ashland, and across Wisconsin to Montreal river, the western boundary of Michigan. The entire length of this division is 120 miles. From Montreal river the line connects successively in a continuous all-rail route to Detroit, with the Ontonagon & Montreal River Railroad, the Marquette, Houghton & Ontonagon and the Detroit, Macinac & Marquette Railways. At Ashland, the Wisconsin Central connects with Milwaukee and Chicago. An independent line of railway, from Superior to Chicago direct, is now under construction, reducing the all-rail distance between these two points to 400 miles.

Between Thompson Junction and Superior, the Wisconsin Division runs through dense and extensive forests of heavy pine timber. The line also opens up and communicates with the pine forests of Northern Wisconsin. On this division, mainly between Thompson and Superior, will be located within the next few years the largest manufacture of pine lumber in the Northwest.

EASTERN DIVISION BRANCH LINES.

There is already projected, and partly under construction, a complete system of branch lines from the Minnesota and Dakota Divisions of the Northern Pacific. The branch lines now under construction, connecting with the main line from the south, are the Little Falls & Dakota Railroad, which meets the main line at Brainerd, 114 miles west of Superior; the Northern Pacific, Fergus & Black Hills Railroad, which leaves the main line at Wadena, a point 161 miles west of Lake Superior; and the Fargo & Southwestern Branch, which connects with the main line at Fargo, the chief city of the Red River valley, 252 miles west of Duluth and Superior. The lines indicated will traverse the most fertile and best producing regions of Minnesota, and districts of Dakota similar in soil, climate and production to the famous hard-wheat regions, which, of demonstrated capacity in the east half of

Dakota, extend vastly on the north of the main line from the Red River valley across the entire territory. Their general direction will, at commanding distances apart, parallel the main line across Minnesota and Dakota.

Across the countries on the north two important branches of the Northern Pacific are now being built. These connect with the main line at Casselton (the Casselton Branch), a point in the Red River valley proper, 20 miles west of Fargo; and at Jamestown (the Jamestown & Mouse River Branch), a point on the Dakota or James river, 94 miles west of Fargo. The Casselton Branch is built and operated on a very commanding route down the Red River valley to Mayville, 42 miles north. From Mayville, one section of this line will continue down the valley of the Red river to a point of junction with the Manitoba & South-western Railroad from Winnipeg. A second section of the Casselton Branch will diverge to the west, opening up a surpassingly fertile country to Devil's Lake and beyond.

The Northern Pacific Branch from Jamestown will be built in a generally northwest direction, skirting the south and west shores of Devil's Lake, and thence northwest to the Mouse river regions, a wide scope of country which has awakened great interest as among the most promising agricultural districts of North-Dakota, and for the abundance of its coal deposits. Other branch lines and extensions are projected, and will be promptly built to a connection with the Northern Pacific as it becomes important to more perfectly develop and drain the great outlying regions on the north—regions which must certainly become as distinguished for quality and reliability of cereal production as is the now famous west half of the Red River valley.

Thus the Northern Pacific and its tributary lines will soon unite the entire vast wheat producing countries of the ultimate Northwest, with the cheap transportation of the great lakes; with Lake Superior at Superior and Duluth, and by its rail extensions and connections with the waters of Lakes Michigan and Huron, and also with Chicago and the Atlantic markets, by the most direct all-rail routes. An important arm of the system also connects these countries with the cities of Minneapolis and St. Paul.

RECAPITULATION OF DISTANCES—MAIN LINE.

	MILES
O. R. & N. Co.—Portland to Wallula.....	210
Pend d'Oreille Division—Wallula to Lake Pend d'Oreille.....	240
Clark's Fork Division—Lake Pend d'Oreille to Clark's Fork.....	150
Missoula Division—Clark's Fork to Frenchwoman's Creek.....	160
Rocky Mountain Division—Frenchwoman's Creek to Yellowstone Crossing.....	150
Yellowstone Division—Yellowstone Crossing to Glendive.....	338
Missouri Division—Glendive to Bismarck.....	221
Dakota Division—Bismarck to Fargo.....	195
Minnesota Division—Fargo to Thompson Junction.....	230
Wisconsin Division—Thompson Junction to Montreal river.....	120
Portland, Oregon, to Montreal river.....	2,014
Montreal river to Macinac.....	290
Macinac to Detroit.....	288
Detroit to Suspension Bridge.....	230
Suspension Bridge to New York.....	447— 1,255
Portland, Oregon, to New York via Detroit (all rail).....	3,269

Puget Sound (Cascade Division) to Superior.....	1,896
Superior to Chicago.....	400
Chicago to New York.....	912— 1,312

Puget Sound to New York, via Chicago (all rail)..... 3,208

Puget Sound to Lake Superior, at Duluth and Superior.....	1,896
Superior to Buffalo (via great lakes).....	1,092
Buffalo to New York (via Erie).....	423

Puget Sound to New York (via great lakes)..... 3,411

The above figures of distances, compared with distances on the Union and Central Pacific lines, show that by the Northern Pacific the all-rail route between the Atlantic and Pacific oceans—between New York and Puget Sound, as compared with the shortest route between New York and San Francisco—is shortened nearly 100 miles. Also that the distance between Puget Sound and New York, by way of the great lakes from Superior to Buffalo, is 400 miles less than that between San Francisco and New York, via the great lakes from Chicago to Buffalo.

THE TRANS-PACIFIC TRADE between the Eastern coasts of Asia, China and Japan and San Francisco, follows the great ocean currents of the Pacific. The direction of this great “river in the ocean” is in a northwest course off the Asiatic coast, crossing the Pacific to a latitude north of Puget Sound, where, bending south, it follows the Pacific coast of the United States. Puget Sound, by the route of steam and sailing vessels, is thus greatly nearer to China and Japan than is San Francisco, and the commerce of the United States with the Orient will receive, by the completion of the Northern Pacific, a practical reduction of length of route from China and Japan amounting to 1,500 miles.

RELATIONS OF THE NORTHERN PACIFIC TO THE WATERS OF THE CONTINENT.

The Northern Pacific, from the inception of the great enterprise, has always enjoyed esteem, favor and popularity among the people of the United States, which no other great line of railway transportation has inherited or acquired. This is due to the important and peculiar physical facts and conditions appertaining to its route across the continent. The Northern Pacific is to develop and populate the great Northern domain of the United States. As has been shown, it is endowed with definite natural advantages as a competing trans-continental line. But specially it is subject to physical limitations which must always measurably influence and regulate its management in the paramount public interest of cheap transportation. The navigable water ways of the continent, which provide means of inexpensive, if less rapid and direct, transportation, must always effectively serve to regulate the price of transportation on the railway lines which come within their territorial influence. To the people who will compactly settle the countries on the Northern Pacific, who will introduce and build up there the institutions of American civilization and enterprise, the juxtaposition of the great water thoroughfares of the continent will afford advantages and guarantees which obtain on no other trans-continental line.

The Columbia river enters Washington Territory on its northeastern boundary, and pursues a devious course south till, bending directly to the west, it forms the

Oregon boundary to the Pacific ocean. It is now navigated by well-established and efficient lines of steamers for a distance of 300 miles from its mouth, and its upper waters can easily be made available for steamers of lighter draught. For more than 250 miles of its line to Portland the Northern Pacific closely follows the valley of this river.

East of the Rocky mountains the Yellowstone river has long been navigated by steamers as far west as Huntley, Montana, a point less than 350 miles east of the head of navigation on the Columbia. The Yellowstone, with the Missouri and Mississippi, forms a continuous route of navigation from the western half of Montana to the Gulf of Mexico. The Northern Pacific traverses the Yellowstone valley from the 105th to the 110th meridian.

The Missouri river is met and crossed by the Northern Pacific at Bismarck, $4\frac{1}{2}^{\circ}$ of longitude west of Omaha on the Missouri, at the crossing of the Union Pacific Railroad. At Fargo, 195 miles east of Bismarck, the Red River of the North is navigable to boats of light draught. The Mississippi river is met by a branch of the Northern Pacific at the head of navigation at St. Paul; and 252 miles east of Fargo the Northern Pacific brings the countries on its eastern divisions into direct communication with the cheap transportation of the great lakes.

In contrast with the magnificent system of inland navigable waterways on either slope of the Rocky mountains, with all their accompanying advantages in perpetuity to the communities on the Northern Pacific Railroad, is the fact that along the entire lines of the Union and Central Pacific Railroads from San Francisco till Omaha is reached, a distance of 1,866 miles, no navigable streams are met.

A GENERAL VIEW OF THE CLIMATES AND SOILS OF THE NORTHERN PACIFIC COUNTRIES.

WESTERN WASHINGTON.

The Cascade range of mountains in Oregon and Washington Territory extends north and south, separating both State and Territory into unequal divisions, which differ appreciably in climate, and considerably in the average character and quality of their soils. West of the range the climate is more perfectly equable, the summer average of the thermometer being 70° , and that of winter being 35° . The extremest annual range of the thermometer is from zero to 85° ; but such degree, either of winter cold or summer mid-day heat, very rarely occurs. The winter rains lasting three months, a period of alternating cloud, mist, rain and sunshine, are usually light, frequently not profuse enough to saturate the clothing during a day's exposure. The moisture of the climate is not in this respect excessive, nor greatly objectionable and unpleasant; in fact, very much less so than is commonly supposed. The soils west of the Cascade range are various. On the numerous and extensive river bottoms is the richest alluvium. The larger proportion of the uplands has a strong clay loam, but considerable tracts are sandy soil, sand and gravel.

The valley of the Willamette river, in Oregon, and the basin of Puget Sound, form a continuous great valley lying between the Cascade and Coast ranges of mountains, having an average width of 75 miles, and being in length 400 miles.

Throughout the Puget Sound basin are immense forests of fir and cedar, of which the growth extends up the mountain sides to their summits. The Coast range approaches closely to the waters of the Sound. From the western slope of the Cascade range many rivers empty into the Sound, the valleys of which contain nearly a million and a half acres of alluvial agricultural lands. The alluvial bottoms are covered with a low, deciduous growth—the vine-maple, alder and crab-apple. Their soil is composed of mountain detritus and the decomposed vegetation of centuries of rank growth. The cultivated lands yield the most abundant crops of grain, hay, hops, fruits and vegetables.

The table lands lying between the great valley and the mountains are of large area, their surfaces subsiding to gentle undulations as they approach the river bottoms, but broken and rugged adjacent to the foot hills. These are generally of less productive capacity than the bottom lands, but for wide intervals the soil is a brown, clay loam, strong and well adapted to field culture. The timber growth of the uplands, greatly enhancing their value, is chiefly the fir and cedar, the fame of which, in the Puget Sound region, where the manufacture of lumber as an article of commerce is the leading industry, has been carried to all parts of the world.

FROM THE CASCADE RANGE TO THE ROCKY MOUNTAINS.

THE CLIMATE of the wide expanse of territory between the Cascade range and the Blue and Bitter Root ranges of the Rocky mountains, or substantially between the 121st and 116th meridians, is subject to the same regulating influence which determines the character of the climate west of the Cascade range. The currents of the Pacific ocean form a great river of equatorial warmth, which, leaving the coast of Japan, flows across the Pacific, and, by a southern deflection from the latitude of Juan de Fuca Strait, follows the American Pacific coast, sends its warm breath over elevated plains and through mountain defiles far into the interior, and even makes its influence apparent east of the Rockies. The climate of the intermediate regions between the Cascade and Rocky ranges is somewhat colder in winter and warmer in summer than the immediate coast climate, being subject in a less, though still remarkable, degree to the influence of the permanent atmospheric temperature generated by the thermal ocean currents. It is, therefore, a climate of such mildness and equability as is altogether unknown at the same or approximate latitudes elsewhere on the American continent east of the Rockies, the average indication being 35° in winter and 70° in summer. Having the latitude of the north of Maine, the extreme of winter cold and summer heat is less than in Northern Ohio, Pennsylvania and Southern New York, to which sections of the United States, in respect of their average temperature, these regions are most comparable. The amount of annual precipitation—rain and snow—is less than west of the Cascade range; but the snow fall alone is greater, there being little or no snow in the coast countries. Snow, however, rarely occurs here before Christmas. The dry season is longer and more extreme in degree, but is not of such severity as to require artificial irrigation for the due growth and maturing of the crops. Only at mid-day is the heat ever considerable; the mornings and evenings are perfectly fine and enjoyable, and the nights are refreshingly and invigoratingly cool.

The topography of the country, between the Cascade mountains on the west, and the Rockies on the east, is of general uniformity from near the southern

boundary of Oregon to the northern boundary of Washington Territory. For more than 150 miles in breadth and 500 miles in length extends the great plain of the Columbia river. This entire region is drained by the noble river which designates the great plain, and is intersected by many important tributaries, watering a series of broad valleys, chief of which are the John Day's river, the Des Chutes, the Umatilla, the Snake or Lewis river, and the Walla Walla Yakima Palouse, Wenatchee, Okinakane, Spokane and Colville rivers.

THE SOILS of the entire country are also substantially uniform in character, consisting of decomposed lava (often of great depths), mingled with lacustrine deposits, and the decayed vegetation of ages, producing conjointly a surface of alkaline loam. The bottom lands are richer in vegetable decomposition, but the soil of the elevated plains and slopes contains a stronger admixture of clay, and is correspondingly more retentive of moisture. The condition and progress of agriculture in the sections traversed by the Northern Pacific Railroad, and north as far as the British boundary, are well and faithfully stated in the following extract from a communication to a local journal by a prominent clergyman of Portland:

"The upper country gives signs of becoming a vast area of grain fields. The stock ranges, rich in bunch grass, are fast changing into far richer fields of wheat, which check the hills and valleys like a carpet. It is a marvel that the high hills produce all the cereals as abundantly as the plains. Its solution is due to a two-fold fact. First, the soil of this whole interior of high prairies was once the bed of a system of lakes, as appears from the lectures of Professor Condon, and illustrated by many fossils of lacustrine and tropical life found embedded therein. * * *

"These high table lands, under the plow, exhibit the finest tilth, from one to twenty feet or more deep, and alike through the whole mass. Unlike the dark, vegetable-mold of the Mississippi basin, the soils of this Columbia basin are whiter and more highly charged with the alkalies and fixed acids. Western farmers are astonished that such whitish lands can produce the cereals; but they are more astonished to gather a harvest of 30 to 60 bushels of wheat per acre from these high tracts. It is also a surprise that the berry of all kinds of grain is so plump and large, and that the straw is so tall and strong.

"The second fact, which solves the problem of reclaiming this interior basin from mere pastures to farm lands, is that the invisible ocean of vapor, constantly borne inward from the Pacific, over these high plains, can be cooled and deposited in the form of dews, mists and showers, so as to furnish all needed irrigation. The complaint was made for thirty years that they were practically deserts. It is only a few years since the plow has moved up the hill-sides. Now fields of wheat, oats, barley and rye wave luxuriantly by the side of dry bunch tracts, even on the higher ranges.

"The plow proves to be the cooler. It opens the light, porous soil to the air, which enters it freely, and parts with its moisture to nourish the plants. The higher the hill, the quicker the cooling process occurs in the still air, so that the night dews and mists water the plants there best every evening, when the wind dies away.

"Whenever the plow is freely used, and the seed planted, the growth of grain and vegetables becomes luxuriant. Orchards, groves and fields increase the cooling surfaces, giving more moisture and more summer showers in all that region, that had been rainless. The practical benefit already is a larger variety of productions, and a grand harvest of cereals for home and foreign markets."

As intimated in the foregoing extract, stock raising has heretofore been the principal industry of Eastern Washington Territory, but the completion of the Northern Pacific will establish the rapid settlement of her rich agricultural lands by purchasers of the soil, and their occupancy for the uses of general farming. The great outlying stock ranges will undergo consequent diminution in number

and extent; and stock industries, while conducted on a smaller individual scale, will be joined to more perfect methods in breeding, and economy of maintenance, and will exhibit improved and greatly larger aggregate results than the ranch system of grazing cattle

MONTANA TERRITORY.

The Northern Pacific enters Montana Territory from the west at a point about 60 miles below the northern boundary. Thence it immediately deflects to the southeast, running midway between the Bitter Root and main ranges of the Rocky mountains till it meets and crosses the main range at Mullen Pass. For this distance it ascends the valley of the Clark's Fork of the Columbia. From the descent of Mullen Pass, it follows a course south of east, soon meeting the valleys of the four forks of the Missouri, and crossing the Bull range at Bozeman Pass it strikes the Yellowstone river at a point nearly midway of the territory and about 50 miles from the Wyoming boundary. Thence it follows the Yellowstone on a general course north of east, and leaving the river at Glendive, crosses the eastern boundary of Montana at a point south of the east and west medium line of the territory.

Montana contains within her limits more than 92,000,000 acres of surface. The central parts are traversed by the Bull, Belt and Little Rocky mountains, and its western portions by the great ranges of the Rockies. Elsewhere, over nearly its entire extent, are scattered spurs, hills and isolated peaks. In the northeast parts along the lower Yellowstone, and other smaller tributaries of the Missouri, are the broken, rugged and impracticable "Bad Lands," but in the midst of these and throughout their surprisingly interesting formations is found an abundance of nutritious grasses, on which large herds of game—buffalo, antelope and deer—subsist. The entire territory is abundantly watered by the Missouri, the Clark's Fork of the Columbia, the Yellowstone, Muscleshell, Marias, Milk, Big Horn, Tongue, Powder and Sun rivers, and by the numberless smaller streams and tributaries—many of these of considerable size—which form the head waters and sources of the Columbia and Missouri rivers.

The situation of the Northern Pacific lines in Montana is such as most advantageously to serve the richest natural resources of the Territory, whether with respect to the industries of mining, agriculture or stock growing. Except where the main line crosses the mountain ranges, it follows and is in favorable juxtaposition to a system of valleys unsurpassed in their broad, beautiful and fertile surfaces, and extending across the entire Territory from west to east. These are, in the order of their occurrence, the intra-montane country of the Clark's Fork of the Columbia, west of the main range, the valleys of the east and West Gallatin, Madison and Jefferson rivers adjacent to the eastern bases of the Rockies, and the great valley of the Yellowstone extending across nearly 400 miles of longitude to the eastern boundary. On the north of the Yellowstone country, intermediate between the Bull, Belt, Big Snowy and Little Rocky ranges, lie the magnificent valley of the Muscleshell, and the broad basin of the Judith; and west of the Belt range is the great valley of the Sun river. Meeting the Yellowstone country from the south are the valley of Clark's Fork of the Yellowstone, the country of the Big Horn (still in possession of the Crow tribe of Indians), and the valleys of the Rosebud, Tongue and Powder rivers. In the southeast are the stock ranges on the head waters of the Little Missouri.

THE CLIMATE of Montana in general, it may be justly claimed, is unsurpassed, and rarely elsewhere equaled in those qualities which sustain and stimulate the energies and delight the senses of men. It is a perfectly salubrious climate. There are days of storms, appearing with more frequency and with greater violence in Eastern Montana—storms of rapid rise and culmination, and subsiding as abruptly, in which the lowering of the temperature is sudden and extreme—that are liable to occur in any season of the year. There are also, in occasional seasons, excessive degrees of winter cold and intensity of summer heat. In these respects Eastern Montana is again less favored than the western portions of the Territory. But the peculiar atmospheric conditions—an exceeding dryness and purity—greatly mitigate the heat of midsummer suns. Also in the dry and usually motionless atmosphere of winter continuous exercise out of doors, with the cold intense, is far more tolerable than in climates of a much less degree of cold, but having the chilling effects of a moist or saturated atmosphere.

But for the greater part of the year the pure air and glorious sunshine, the many days of serene, inspiring aspect and influence of atmosphere, sun and sky, render a residence in Montana pleasant and delightful to an unusual degree.

While in its healthful, invigorating and luxurious qualities the climate of Montana can be confidently asserted to be superior to that of most other countries, there also remains no just doubt of the adaptability of its seasons to successful agriculture over the greater portion of its area available for farms. In the valleys lying adjacent or nearer to the Rocky mountains, where alone irrigation is required for the growing crops, the flooding of the fields from the mountain water courses is easy and inexpensive. But though experience has been small in the eastern half of Montana, being confined to scattered points in the Yellowstone valley from Huntley to Miles City, it conclusively demonstrates the exceeding natural fertility of the soil, and sufficiently establishes the fact that artificial irrigation is not needed for crop production.

The meteorological observations made at the United States Signal Station at Fort Keogh, near Miles City, commenced Jan. 13, 1879, show the rainfall in the growing months, April, May, June and July, of 1880, to have been 11.08 inches; and in May, June and July, 1881, to have been 5.59 inches. The season of 1881 was the driest ever known in Montana, yet the crops in the Yellowstone valley, from Powder river west, even those raised on sod or new ground, and in all cases without any attempt at irrigation, were notably excellent. The greater part of Eastern Montana, substantially the whole eastern half of the Territory, has, until within the last two years, been but little known or tested, having been inaccessible to white settlers or pioneers by reason of its practical possession by the Indians, and the continued prevalence of Indian hostilities.

However, instances of soil cultivation through a series of years are not wanting along the Upper Yellowstone, and have been uniformly accompanied with large results. These, conjointly with recent experience down the eastern parts of the Yellowstone valley, and during one season of exceptionally scant rainfall, go far to remove the question of climate in its suitability to agricultural pursuits out of the realm of speculation and theory, and to place this great industry in Eastern Montana in the sure field of experience and fact.

In illustration of the products of Montana soil is published the letter below from Gen Miles, then commanding at Fort Keogh. The letter is republished

here because the results indicated were from the first attempts at field culture in that portion of the valley, and the letter itself is a disinterested and authoritative statement from an officer of well-known reputation in the service. The samples sent were, as attested by the *St. Paul Pioneer Press*, which originally published Gen. Miles' letter, "spring wheat of a very superior quality, that yielded 41 bushels to the acre; Australian club wheat that was sowed on the 28th of March and harvested on July 30th; flint corn, of three varieties; potatoes that weighed three pounds; onions that measured 15 inches in circumference, and that weighed from one pound and a half to two (!) pounds; and so on with squashes, cabbage, beets, turnips, carrots, pumpkins, and in fact everything else that can be raised in the temperate zone, and all equal in size and quality to the articles that usually carry off the prizes at agricultural fairs. Accompanying these specimens of Montana's agricultural production is a statement giving the names of the parties that raised them, as well as the locality where they were raised."

HEADQUARTERS FORT KEOGH, M. T., Oct. 10, 1879.

To the General Manager of the Northern Pacific Railroad, St. Paul, Minn. :

DEAR SIR—I send you a box containing some samples of the vegetable products of the Yellowstone valley. They were raised by some of the settlers in this vicinity, and by the soldiers at Fort Keogh. It is worthy of notice that these different kinds of cereals and vegetables were raised on sod or new ground, and without irrigation. The companies in my command have served in almost every section of our country from Florida to Utah, and from the lakes to New Mexico, and have never been more successful with their gardens. It has been a disputed question by some parties, who were evidently not well informed, as to whether grain could be raised in this section of country. Lewis and Clarke, who first explored this country in 1805, reported that they were feasted upon hominy, melons, squashes, etc., etc., by the Indians then occupying this region of country. These samples of corn, wheat and oats prove, beyond question, that this is not only a country rich in mineral and pastoral wealth, but that every kind of food required for man and beast can be raised in great abundance. Such luxuries as melons, cantelopes, tomatoes and strawberries, plums, raspberries, and cherries can be cultivated successfully,—the last three grow wild. From all indications the Yellowstone valley, as well as the adjacent country, is destined very soon to be occupied by large and prosperous settlements. Sending these at this season of the year, they may become frozen or injured in the long distance, but their condition will be such, I trust, as to show the positive fruits of this country.

Very respectfully, your obedient servant,

NELSON A. MILES,
Colonel Fifth Infantry Commanding.

THE SOIL of the great valleys of Montana is a rich, heavy alluvion in the bottom lands next the streams. On the bench lands, which rise in successive elevations, terrace like, or in gently inclining slopes, to the bluff line, the soil is a lighter loam, carrying a great abundance of the elements of cereal and gramineal growth. On the table lands the soil is similar to that of the bench lands in the valleys.

The entire face of the country, including the broad bench lands, the vast expanses of the table lands, the foot hills, and sometimes the mountain sides, is, in its natural state, covered with the perennially nutritious bunch grass, a term applicable to plains vegetation in all countries, indicating the manner, not the variety or quality of grass growth—that is, growing openly in clusters or bunches having interstitial spaces of bare ground. In the neighborhood of the mountains vegetation is more luxuriant and retains longer its verdure. In general, over the territory the grasses—standing from six to fourteen inches high—do not remain

green later than July. They have then become cured, and show a dull, yellow color, like in hue, but lacking much of the sheeny lustre of a field of ripened grain. So cured into the best of hay, the standing grasses retain perfectly unimpaired their esculent and highly nutritious qualities throughout the winter until spring has again returned with its renewal of vegetable life.

The native grasses of Montana are well known to exist in greater abundance than, and as food for animals to be superior in quality to, those which grow in the States and Territories on the south. In fullness and strength of nutriment they doubtless surpass the best cultivated grasses. The bunch grass of Montana grows more compactly—leaving but very slight openings of visible ground—and its clusters are denser and finer than elsewhere found. It has a more solid stalk than any of the tame grasses, and is a prolific bearer of fine, firm seed. The native animals of the plains, and the grazing stock leave the green grasses of the bottoms to feed with keener relish on the more vigorous sustenance of the cured, yet sweet, bunch grass of the uplands, and on it alone stock keep fat the year round.

TIMBER.—Mr. R. H. Mason, Surveyor General of Montana, in a late report to the Department of the Interior at Washington, writes as follows:

“The Territory is well timbered throughout, the mountains being covered with a dense growth of pine, fir and spruce, some of which attain very large proportions, while cottonwoods and willows border the streams. There are some small groves of ash, and I am informed that large bodies of oak have recently been found on the head waters of Tongue river, near the southern boundary. The forests in the immediate vicinity of settlements have suffered somewhat from the wanton depredation of settlers, who often destroy half a dozen small trees in obtaining one of the requisite size for their purposes; but even in those portions where the hillsides have been stripped entirely bare I have noticed a sturdy and flourishing second growth. The loss from forest fires is far greater than from any other source, but as the country becomes more settled, and the Indians, who are most careless with fire, are kept upon their reservations, these will become less frequent.”

In remarking that “the Territory is well timbered throughout,” the Surveyor General must be understood as referring more particularly to Western and Central Montana. Montana everywhere is much better timbered than the Territories further south, but the large forests belong chiefly to the mountain ranges and cañons. In other portions of the Territory the timber is in the main confined to the valleys of the rivers and streams, and the great tracts of intermediate uplands are without wooded growth.

COAL.—In those parts of the Territory where there is a prevalent infrequency of timber, coal exists in great abundance. The tertiary beds underlie a great part of Montana, and extensive veins of coal (lignite) occur near the surface and crop out along the bluff ranges on the rivers. Not all these strata of lignite are of sufficient thickness and purity to justify the investment of mining operations; but many of the beds so far discovered are from four to six and eight feet in thickness, without the clay intercalations which impair others of the veins, and mines of importance for working them are already established along the line of the Northern Pacific. The universal presence of lignite in these portions of the Territory settles the question of fuel, so important to the future settlers. The lignite is not equal in solidity and durability as fuel to bituminous coal; but it burns easily, and, if with little flame, with intense heat. Stoves best adapted for its use are now being introduced, and are proving of such efficiency as to render it practically as serviceable for domestic uses as the heavier coals.

MINERALS.—It is yet impossible to attempt any form of estimate, approaching reliability, of the vast mineral resources of Montana. The earlier pursuit of the precious metals was in Montana, as in the other mineral-bearing Territories, confined to gulch washing or placer mining. In the occupied portions of the Territory the richest gulches have been worked; but new placers are from time to time being discovered, and "there are," remarks the Surveyor General in the report above quoted from, "immense areas of placer ground which will pay a handsome profit whenever labor can be procured at from \$1.50 to \$2 per diem."

Quartz or lode mining is still in its very infancy in Montana. Within the last two or three years, however, such developments have been made at several of the more important mining camps, particularly at Philipsburg, Butte City, and in the more extended Boulder and Helena districts, as prove the permanency and great value of the ore deposits which carry the precious metals. The Butte District, less extended in area than others, but more compactly mined, is the chief mining centre of the Territory. Within the past two years there has been greatly increased activity at Butte, and many improvements and developments have been made. The mines are down to a depth of 800 feet or more, and show such quantities of ore matter in regularly defined seams and veins that entire confidence is felt in their permanency. Butte seems destined to prove the Comstock of Montana.

The isolated situation of Montana, the Territory being without railroads, the great expence of transportation and cost of reduction of ores, have retarded mining enterprises, and rendered only the higher grades of ores practicable. Montana's product of gold and silver has, notwithstanding, been considerable, and the best authorities predict such an expansion of mining industry and enterprise, and such an increase of production in the near future, as to equal the record of Nevada in her best years. The approach of the Northern Pacific to the mining regions of Montana is already reanimating this industry, awakening new enterprise, and putting new life into the development of this great natural resource of the Territory. The yield of the precious metals from the few and confined districts in the great mineral belt of Montana, which have thus far been partially developed, aggregates in the last three years more than \$15,000,000.

STOCK RAISING.—In this general view of the regions traversed by the Northern Pacific, the writer will have accomplished his purpose if he presents the leading and distinguishing generalizations of the countries under consideration—of their soils, climates and productions—in such manner as to faithfully summarize the details of fact and experience, on which such comprehensive observations are based. Detail itself, which would expand a brief chapter of general statement into a volume of descriptive and statistical exhibit, can not here be undertaken.

At the outset of a short reference to the important interest of stock raising in Montana, the well-known fact should be kept clearly in view, that the Territory of Montana is not like Southern Wyoming, Eastern Colorado, Western Nebraska, Western Kansas, New Mexico and Western Texas, an unbroken expanse of plains country, alike in topography, having few and shallow water-courses, without timber, destitute of seasonable rainfall, and possessing little or no agricultural value—countries where the vast, free pasturage of cattle has so far proved the only use for which they are available. It is by no means the intention of the writer to, in any manner, or for any purpose, disparage the Territories named, but merely to recall the well-known facts which bear on the methods and limits of stock growing as pursued in those countries, and the facts, forming an obvious contrast, which prescribe the future extent and character of the industry in

Montana. Irrespective of its mountain regions, Montana is everywhere a country of broken and varied topography. Its table lands, most nearly corresponding in surface with the plains countries on the south, are widely intersected by great valleys and basins hundreds of miles in length and many miles in width, and by numerous valleys of lesser area. The entire Territory is perfectly watered by the head waters, many important tributaries, and numberless lesser sources of the chief river systems of the American Continent, which discharge their waters into the Gulf of Mexico and the Pacific ocean. Endowed, it is believed, over the main part of its area adapted by soil and position to agricultural pursuits, with sufficient rainfall for general crop production, its mountain descending streams adequately provide cheap facilities for irrigation wherever irrigation is required, or whenever it can conduce to the best results of field culture. The valleys and basins alone of Montana comprise an aggregate area of more than 20,000,000 acres, and portions not inconsiderable of her uplands are so situated as to early invite and encourage their subjection to the plow. It is apparent that the more ready and profitable agricultural lands of the Territory can not long be surrendered to the system of free pasturage, of limitless cattle ranges, which still exclusively prevails in the great plains countries of Wyoming, Colorado and kindred regions.

These distinctions being noted, there will probably remain, for years at least, large districts of Montana which, by their position, relatively, of isolation from market, character of country, or comparatively less productive forces of soil and climate, can be most profitably utilized for the grazing of cattle.

Three facts or conditions unite to make attainable the highest degree of success and profit in the industry of grazing cattle, on the extensive scale practiced in our Western Territories: 1. The abundance of nutritious grasses. 2. The mildness and equability of climate, which avoids the necessity of winter feeding and shelter. 3. Availability of country to market.

The superior quality and consequent higher price of the beef fattened in Eastern Washington and Western Montana over those of Colorado, Wyoming, Utah, Kansas, Nebraska and Texas, have always been recognized facts in the Eastern markets. This has remained true, notwithstanding the heretofore long drive of two months or more from those remote districts to points of shipment on the Union Pacific Railroad, across countries less abounding in rich grasses and pure water. By the extension and completion of the Northern Pacific across Montana, her cattle will be enabled to reach market in their full condition.

The superiority noted of the cattle of Montana and Washington is due to the fact that the conditions of success above stated combine in a more perfect degree in those Territories than elsewhere—the extension of the Northern Pacific line being now sufficiently advanced westward to afford dispatch in transportation to export markets. But it is without doubt more particularly due to the superior abundance and excellence of the native grasses. The bunch grass of Montana, which begins to renew itself in the early spring, before the ground is yet free from frost, rapidly attains its growth, is early cured, and stands as hay through the remainder of the year until the succeeding spring. Throughout the winter months it as perfectly retains its sweet and nutritious qualities as when first cured by the summer sun. The manner of its growth is similar to that of the short, curly, and quickly cured buffalo grass of the plains. As before stated, it grows in detached clusters or bunches, between which are visible interstices of bare ground. It is, however, another and quite dissimilar variety of vegetation; its clusters are finer, denser, of much taller growth, and cover the ground more

closely and compactly than the short, crisp and curly tufts of buffalo grass. A single acre of bunch grass is fully equal to three acres of average buffalo grass in the quantity it furnishes of actual sustenance for cattle. It is moreover, a stronger and more robust nutriment than ordinary plains vegetation, being in the fullness of its aliment scarcely surpassed by the best cultivated grasses, timothy hay or clover. Favored by a climate which obviates the necessity of food having the heating qualities of grain, the results of winter feeding on bunch grass in Eastern Washington and Western Montana are like those from the maintenance of stock in more severe climates on plenty of hay, with regular and liberal feeds of corn. Cattle thus fatten rapidly and keep in good condition throughout the year on the native bunch grass, and their beef is remarkably succulent, sweet and tender. It is a fact that even close to the summits of the mountains at the sources of the Columbia and Missouri, cattle are taken from the ranges in the spring, the condition of which is not inferior to that of the best Eastern stall-fed bees.

While, ordinarily, the character of the winters in Eastern Washington and Western Montana renders winter feeding of cut hay and the providing of shelter for stock unnecessary, there yet occur winters of occasional severity, such as to require these precautions against loss of stock. The cost of hay in the stack, cut with machines from the tall grasses in the river bottoms, will never exceed \$1 a ton, and may often be collected at much less expense. In that country hay in stack will keep its esculent and nutritive properties for years, if not sooner needed for winter feeding. In the severer winters cattle will never require to be foddered longer than from one to two months.

The uncommon fecundity of the cows and extraordinary increase of the herds form another distinguishing advantage which accrues to the stock industry of Montana. Instances are not infrequent of cows in considerable numbers, turned loose on the cattle ranges in the summer, which in the following spring were driven in with each a healthy and promising calf at her side.

The following statement of the profits of stock raising in Montana, was published by a competent and careful inquirer before the entrance into the Territory of the Northern Pacific Railroad. It was at the time a moderate statement, and one well justified by the current facts. With the added advantage of short drives to neighboring convenient points of shipment, by the shortest possible railway line to Eastern markets, the cost of marketing cattle will be henceforth greatly reduced.

"Of course in this vast free pasturage, no one need really own an acre of land, and thus far few have cared to. But all stockmen have headquarters as near their range as practicable. This is called the ranch, and usually consists of a plain log cabin, and a large corral or pen in which stock can be held at branding time. What extent of the boundless grass lands surrounding are utilized by the owner, depends entirely upon the size of his herd, and his inclination to let cattle roam and care for themselves. It is true that ranch sites are sometimes better improved, and herders employed; but to feed, water, shelter or salt the steer of the period would be a sad innovation upon the all-prevailing custom of letting said steer shift for himself. The improvements need not cost more than \$250—not that, if the owner will rely largely on his own muscle. The additional expense will be the cost of living, if the owner does his own herding, and this will vary from \$250 to \$400 per year; if herders are employed, they are paid about \$40 per month and board. One man can easily care for 1,000 cattle, except during the "round up" period, which here occurs twice per year, lasts about two weeks each time, and will require three or four extra men during that time. I have before me the statement of a stockman who commenced with \$3,500, buying 100 head of cows, putting up a neat log cabin, and reserving enough of the capital to pay his expenses for one year. At the end of the fourth year the increase from this little

herd, at a low valuation, was worth \$8,000. Another statement made by a well known stockman of Helena, shows a net profit of \$42,500, made in six years from an investment of \$13,500.

"The average profit realized can without doubt be placed at two per cent. per month on all capital invested in cattle in Montana. Men who put a few hundred dollars into cattle five or six years ago have become rich almost before they could realize how wonderfully the profits multiply in a region where food and shelter for their herds cost nothing."

The raising of sheep requires more careful and, consequently, greater cost of management than that of cattle, but the returns are quicker, and the profits are generally estimated to be larger. The proceeds from an investment in a herd of young cattle begin to be realized after the lapse of three years, but the wool of the flocks affords a revenue from the first season's operations. The lowest calculation of net profit from sheep is 25 per cent. per annum, but instances of 50 and 75 per cent. per annum on the entire investment are not uncommon in Montana, and in some cases more than 100 per cent. per annum has been returned for a series of years.

Abundant capital is not essential to the person who would engage in the business of stock growing. Capital is merely the measure of the extent to which it may be entered upon at the outset. Little or much capital may be employed as suits the circumstances of the individual, and with equal proportionate success. Nor is much skill or technical knowledge of the pursuit required. Some acquaintance with its simple conditions and methods is desirable, but these may be quickly and easily familiarized. And without doubt it would be difficult if not impossible to designate any other branch of business industry in the world, which, during a term of years, will certainly accumulate such large and so easily acquired profits as the raising of cattle in the countries conveniently adjacent to the Northern Pacific Railroad in Montana.

Previous to the construction of the Northern Pacific Railroad into the eastern confines of the Territory, the industry of cattle raising had been exclusively confined to Western Montana. It was not, in fact, till the year 1880, that by the complete expulsion and suppression of the hostile tribes of Indians, after repeated expeditions by United States troops through a series of years, Eastern Montana became entirely safe for the occupancy of white settlers with their property. During the last two years many herds of cattle have been driven from the eaten off, reduced or exhausted pastures of the Territories on the south, and ranged in the country on the head waters of the Little Missouri, and in the Yellowstone, Muscleshell and Judith countries. The conditions of full success in this industry obtain similarly in Eastern as in Western Montana. The cold season is of greater average length and severity, and precautions against loss by exposure in winter are more certainly and definitely required. But, on the other hand, in the virgin and primitive fullness of its nutritious bunch grass, Eastern Montana is probably to-day the best grazing country in the world. The ranch system of grazing cattle, where it is long extensively practiced, proves in time to exhaust and wear out the pasturage of the cattle ranges, and they need to be renewed by lying exempt from the feeding and tramping herds until they can regain their fullness of vegetation. The vast unoccupied grazing districts of Eastern Montana have as yet known only the hoofs of the migratory buffalo and antelope, which remaining but for a short time, and in comparatively small numbers during late years, have left the grasses unimpaired.

The entire eastern half of the Territory is now opened up to communication

with the world of business and traffic by the Northern Pacific Railroad, and perfect security of possession is guaranteed to the settlers and occupants of its broad and fertile regions. So vast an accession of incomparable grazing country is rapidly enlarging the stock interests of Montana, and the fattening of cattle and increase of sheep on its limitless ranges will, until such probably early period as agricultural settlements shall have superseded them in wealth of production, remain, second to the mining of the precious metals, the leading industry of the Territory.

The great and varied resources of Montana have yet been tested and proved by the experience of men only in comparatively limited localities, and nowhere to the full measure of their capabilities. Until the entrance into her borders of the Northern Pacific Railway, the Territory was too remote to attract but few others than those induced to make the long overland journey by the increasing evidences of her permanent wealth of the precious metals. The direct approach from the east was also rendered unsafe by the long continued hostile attitude of the Indians who occupied the intervening countries, and for the same reason her entire eastern area was impracticable to settlers. But the same general conditions of agricultural and pastoral success obtain throughout her vast domain as have been tested with such remarkable and indeed extraordinary results in the countries interior of the mountain ranges, and the valleys immediately adjacent on the east. Add to this class of facts an everywhere prevalent climate and atmosphere of the most genial and luxurious influence upon the senses during the greater portion of the year, and in which human life finds better conditions throughout the year for amplitude and freedom of health, and ebullient vital force than can well be found elsewhere, and it can not be gainsaid that no other Western State or Territory offers inducements to a large, varied and enterprising immigration superior to those so abundantly held out by Montana.

THE YELLOWSTONE PARK.

The Yellowstone National Park, the localities of which had been previously explored by various expeditions acting under government orders, was dedicated and set apart "as a public park or pleasure ground" by Act of Congress, March 1, 1872. Its limits, as defined by the Act, include several hundred square miles. It is under the exclusive control of the Secretary of the Interior, who has authority to enforce such regulations as are necessary for its proper care and government, and its protection and preservation exclusively for the public benefit. The only practicable routes for entering this great Geyser Region are by ascending the Yellowstone valley from the north, and from the west following the Firehole Fork of the Madison river. By one of these routes, not unlikely by the Yellowstone Cañon, it is expected that the Northern Pacific will commence the construction of a branch line to the limits of the National Park during the season of 1882. The length of such required line will not exceed 60 or 70 miles. Heretofore the isolation and difficult accessibility of the Geyser Region have deterred all but a few more enterprising and resolute tourists from attempting to visit this greatest Wonder Land of the globe. When the Northern Pacific shall have reached its limits, the National Park, with its gigantic and dreadful phenomena of Nature so mighty as to overwhelm conception and appal belief; and, too, its abounding objects of scenic splendor, grace and magnificence, its terrors, its wonders and its

delights, will be open to all the world, and will be visited by thousands from all parts of the civilized globe.

No attempt can here be made to even state, much less to describe, the numerous wonderful features of the Yellowstone Park. A few brief pen pictures from the many contained in the Report of Lieutenant G. C. Doane, who was in command of the escort, which, in 1870, accompanied H. D. Washburn, Surveyor General of Montana, to this remarkable region, will best convey such impressions of its grandeurs and beauties as space here affords.

THE MIDDLE CAÑON.

* * * "The river breaks through this plateau in a winding and impassable cañon of trachyte lava over 2,000 feet in depth; the middle cañon of the Yellowstone, rolling over volcanic boulders in some places, and in others forming still pools of seemingly fathomless depth. At one point it dashes here and there, lashed to a white foam, upon its rocky bed; at another it subsides into a crystal mirror, wherever a deep basin occurs in the channel. Numerous small cascades are seen tumbling from the rocky walls at different points, and the river appears from the lofty summits a mere ribbon of foam in the immeasurable distance below. This huge abyss, through walls of flinty lava, has not been worn away by the waters, for no trace of fluvial agency is left upon the rocks; it is a cleft in the strata brought about by volcanic action, plainly shown by that irregular structure which gives such a ragged appearance to all such igneous formations. Standing on the brink of the chasm, the heavy roaring of the imprisoned river comes to the ear only in a sort of hollow, hungry growl, scarcely audible from the depths, and strongly suggestive of demons in torment below. Lofty pines on the bank of the stream 'dwindle to shrubs in dizziness of distance.' Everything beneath has a weird and deceptive appearance. The water does not look like water, but like oil. Numerous fish-hawks are seen busily plying their vocation, sailing high above the waters, and yet a thousand feet below the spectator. In the clefts of the rocks, down, hundreds of feet down, bald eagles have their eyries, from which we can see them swooping still further into the depths to rob the ospreys of their hard-earned trout. It is grand, gloomy and terrible; a solitude peopled with fantastic ideas; an empire of shadows and of turmoil."

FROM THE SUMMIT OF MOUNT WASHINGTON.

"The view from the summit is beyond all adequate description. Looking northward from the base of the mountain, the great plateau stretches away to the front and left with its innumerable groves and sparkling waters, a variegated landscape of surpassing beauty, bounded on its extreme verge by the cañons of the Yellowstone. The pure atmosphere of this lofty region causes every outline of tree, rock or lakelet to be visible with wonderful distinctness, and objects twenty miles away appear as if very near at hand. Still further to the left the snowy ranges on the head waters of Gardiner's river stretch away to the westward, joining those on the head of the Gallatin, and forming with the Elephant's Back, a continuous chain, bending constantly to the south, the rim of the Yellowstone Basin. On the verge of the horizon appear, like mole-hills in the distance, and far below, the white summits above the Gallatin valley. These never thaw during the summer months, though several thousand feet lower than where we now stand upon the bare granite, and no snow visible near, save in the depths of shaded ravines. Beyond the plateau, to the right front, is the deep valley of the East Fork bearing away eastward, and still beyond, ragged volcanic peaks, heaped in inextricable confusion, as far as the limit of vision extends. On the east, close beneath our feet, yawns the immense gulf of the Grand Cañon, cutting away the bases of two mountains in forcing a passage through the range. Its yellow walls divide the landscape nearly in a straight line to the junction of Warm Spring creek below. The ragged edges of the chiasm are from 200 to 500 yards apart, its depth so profound that the river-bed is nowhere visible. No sound reaches the ear from the bottom of the abyss; the sun's rays are reflected on the further wall, and then lost in the darkness below. The mind struggles and then falls back on itself, despairing in the effort to grasp by a single thought the idea of its immensity. Beyond,

a gentle declivity, sloping from the summit of the broken range, extends to the limit of vision, a wilderness of unbroken pine forest.

"Turning southward, a new and strange scene bursts upon the view. Filling the whole field of vision, and with its boundaries in the verge of the horizon, lies the great volcanic basin of the Yellowstone. Nearly circular in form, from 50 to 75 miles in diameter, and with a general depression of about 2,000 feet below the summits of the great ranges which form its outer rim, Mount Washburn lies in the point of the circumference, northeast from the centre of the basin. Far away in the southwest, the three great Tetons on Snake river fill another space in the circle, and connecting these two highest are crescent ranges, one westward and south, past the Gardiner's river and Gallatin, bounding the lower Madison and thence to the Jefferson, and by the Snake River range to the Tetons. Another eastward and south, a continuous range by the head of Rose Bud, inclosing the sources of the Snake, and joining the Tetons beyond. Between the south and west points, this vast circle is broken through in many places for the passage of the rivers; but a single glance at the interior slopes of the ranges shows that a former complete connection existed, and that the great basin has been formerly one vast crater of a now extinct volcano. The nature of the rocks, the steepness and outline of the interior walls, together with other peculiarities to be mentioned hereafter, render this conclusion a certainty. The lowest point in this great amphitheatre lay directly in front of us, and about eight miles distant—a grassy valley, branching between low ridges, running from the river toward the centre of the basin. A small stream rose in this valley, breaking through the ridges to the west in a deep cañon, and falling into the channel of the Yellowstone, which here bears in a northeast course, flowing in view as far as the confluence of the small stream, thence plunged into the Grand Cañon, and hidden from sight. No falls can be seen, but their location is readily detected by the sudden disappearance of the river; beyond this open valley the basin appears to be filled with a succession of low, converging ridges, heavily timbered, and all of about an equal altitude.

"To the south appears a broad sheet of water—the Yellowstone lake. Across the Grand Cañon, on the slope of the great mountain wall, is the steam jet seen this morning; and in the next ravine beyond it are six more of inferior volume. Still further south are others, to the number of perhaps twenty, and to the southwest more of them, scattered over the vast expanse of the basin, rising from behind the wooded hills in every direction."

THE UPPER FALL OF THE YELLOWSTONE.

* * * "After ascending about 600 feet a plateau is reached overlooking the cataract, which is inaccessible at its brink. The river comes down for over half a mile above, over a series of lava ledges, each terminating in a fall of from 10 to 15 feet; of these there are five. Then with a tremendous current, and confined in a rocky channel, narrowed to a space of 80 feet, it is hurled from the brink of a perpendicular wall, a sheer descent of 115 feet. So rapid is the current that the great mass of foam shoots out clear of the rock and falls far out in its basin, striking upon a covered ledge at an angle which causes a portion of the water to be projected like a broad fan into the air, with a hissing sound, to the distance of 60 feet, and afterward dissolving into clouds of spray. The depth of water on the brink is about four feet, and the concussion of the fall is tremendous. A lava promontory overhangs the basin on either side, giving fine opportunities for observation."

THE YELLOWSTONE LAKE.

"The lake lies close to the east range, in the rim of the Great Basin, and presents an appearance at once beautiful and imposing. Its eastern shore extends southward from camp in a line broken by various inlets, to the distance of 26 miles. Its general form is triangular, with apices in the south, southwest and north points. The Yellowstone leaves the lake from the west side, starting with a slow current, in a channel one-fourth of a mile wide, and deep enough to swim a horse. The shore on the east side, for five miles, is a broad and level beach of sand, and the lake is shallow for some distance out from the edge. This sand is composed almost entirely of obsidian, and those minute crystals known as Cali-

fornia diamonds. Near camp, on the edge of the lake, is a small boiling spring, having numerous spouts far out in the water. At the mouth of the creek are large swampy districts, flooded, and the resort of myriads of water-fowl. Farther down the south shore, spurs of the range come down into the basin with bluff fronts. On the south side these promontories project far into the lake in great numbers, dividing it into bays and channels. On the west side is a low bluff of the timbered ridges, with a sand beach in front along the margins of the waters. The greatest width of open water in any direction is about 18 miles. Several islands are seen, one of which is opposite the channel of the river and five miles from the east shore; another is ten miles farther south, and two miles from the shore—a mountain isle with a bold bluff all around to the water's edge. Numerous steam jets pour out from the bluffs on the shore at different points. The waters of the lake reflect a deep blue color, are clear as crystal, and doubtless of great depth near the centre. The extreme elevation of this great body of water, 7,714 $\frac{3}{4}$, is difficult to realize. Place Mount Washington, the pride of New England, with its base at the sea level, at the bottom of the lake, and the clear waters of the latter would roll 2,214 feet above its summit. With the single exception of Lake Titicaca, Peru, it is the highest great body of water on the globe."

A MUD GEYSER.

"A few hundred yards from here is an object of the greatest interest. On the slope of a small and steep wooded ravine is the crater of a mud volcano, 30 feet in diameter at the rim, which is elevated a few feet above the surface on the lower side, and bounded by the slope of the hill on the upper, converging, as it deepens, to the diameter of 15 feet at the lowest visible point, about 40 feet down. Heavy volumes of steam escape from this opening, ascending to the height of 300 feet. From far down in the earth came a jarring sound, in regular beats of five seconds, with a concussion that shook the ground at 200 yards distance. After each came a splash of mud, as if thrown to a great height. Occasionally an explosion was heard like the bursting of heavy guns behind an embankment, and causing the earth to tremble for a mile around. These explosions were accompanied by a vast increase of the volumes of steam poured forth from the crater. The distances to which the mud has been thrown are truly astonishing. Directly above the crater rises a steep bank, 100 feet in height, on the apex of which the tallest tree near is 110 feet in height. The topmost branches of this tree were loaded with mud 200 feet above, and 50 feet laterally away from the crater. The ground and fallen trees near by were splashed at a horizontal distance of 200 feet. The initial propulsion is nearly vertical, and the mud to produce such effects must have been thrown to a perpendicular elevation of at least 300 feet. It was with difficulty we could believe the evidence of our senses, and only after the most careful measurements could we realize the immensity of this wonderful phenomenon."

A GEYSER FOUNTAIN.

* * * "In a few minutes the eruption ceased, and we were enabled to approach the crater. This had originally been a crack or fissure in the calcareous ledge, the seam of which could be traced by minute vents a distance of 60 feet, but was now closed up by deposits from the water to an opening seven feet long by eight feet wide in the centre, from which the steam escaped with a loud, rushing sound. The hillock formed by the spring is 40 feet in height, and its base covers about four acres. Near the crater and as far as the irruptive waters reach, the character of the deposit is very peculiar. Close around the opening are built up walls, eight feet in height, of spherical nodules, from six inches to three feet in diameter. These, in turn, are covered on the surface with minute globules of calcareous stalagmite, incrustated with a thin glazing of silica. The rock, at a distance, appears the color of ashes of roses, but near at hand shows a metallic gray, with pink and yellow margins of the utmost delicacy. Being constantly wet, the colors are brilliant beyond description. Sloping gently from this rim of the crater, in every direction, the rocks are full of cavities, in successive terraces, forming little pools, with margins of silica the color of silver, the cavities being of irregular shape, constantly full of hot water and precipitating delicate coral-like beads of a bright saffron. These cavities are also fringed with rock around the edges, in meshes as delicate as the

finest lace. Diminutive yellow columns rise from their depths, capped with small tablets of rock, and resembling flowers growing in the water. Some of them are filled with oval pebbles of a brilliant white color, and others with a yellow frost work which builds up gradually in solid stalagmites. Receding still farther from the crater, the cavities become gradually larger and the water cooler, causing changes in the brilliant colorings, and also in the formation of the deposits. These become calcareous spar, of a white or slate color, and occasionally variegated. The water of the geysers is colorless, tasteless and without odor. The deposits are apparently as delicate as the down on the butterfly's wing, both in texture and coloring, yet are firm and solid beneath the tread. Those who have seen stage representations of "Alladin's Cave" and the "Home of the Dragon Fly" as produced in a first-class theater, can form an idea of the wonderful coloring, but not of the intricate frost work of this fairy-like, yet solid mound of rock, growing up amid clouds of steam and showers of boiling water. One instinctively touches the hot ledges with his hands, and sounds with a stick the depths of the cavities in the slope, in utter doubt of the evidence of his own eyes. The beauty of the scene takes away one's breath. It is overpowering, transcending the visions of the Moslem's Paradise. The earth affords not its equal. It is the most lovely inanimate object in existence. The period of this geyser is fifty minutes. First an increased rush of steam comes forth, followed instantly by a rising jet of water, which attains, by increased impulsions, to the height of 125 feet, escaping with a wild hissing sound, while great volumes of steam rise up to an altitude of 500 feet from the crater. Rainbows play around the tremendous fountain, the waters of which fall about the basin in showers of brilliants, then rush steaming down the slopes to the river. After a continuous action for a space of five minutes, the jet lowers convulsively by degrees, the waters finally disappear, and only a current of steam pours forth from the crater."

THE GRAND GEYSER OF THE WORLD.

On the summit of a high ledge of stalagmite, sloping from the base of the mountain down to the river is the grand geyser of the world, a well in the strata 20 by 25 feet in diametric measurements, the perceptible elevation of the rim being but a few inches, and when quiet having a visible depth of 100 feet. The edge of the basin is bounded by a heavy fringe of rock, and stalagmite in solid layers is deposited by the overflowing waters. When an eruption is about to occur the basin gradually fills with boiling water to within a few feet of the surface, then suddenly, with heavy concussions, immense clouds of steam rise to the height of 500 feet. The whole great body of water, 20 by 25 feet, ascends in one gigantic column to the height of 90 feet, and from its apex five great jets shoot up, radiating slightly from each other, to the unparalleled altitude of 250 feet from the ground. The earth trembles under the descending deluge from this vast fountain, a thousand hissing sounds are heard in the air; rainbows encircle the summits of the jets with a halo of celestial glory. The falling water plows up and bears away the shelly strata, a seething flood pours down the slope and into the river. It is the grandest, the most majestic, and most terrible fountain in the world. After playing thus for twenty minutes it gradually subsides, the water lowering into the crater out of sight, the steam ceases to escape, and all is quiet. This grand geyser played three times during the afternoon. Its waters are of a deep ultra-marine color, clear and beautiful. The waving to and fro of the gigantic fountain, when its jets are at their highest, and in a bright sunlight, affords a spectacle of wonder of which any description can give but a feeble idea."

NORTHERN DAKOTA AND MID-WESTERN MINNESOTA.

Professor Denton, of Massachusetts, distinguished as a brilliant geologist and expert in agricultural chemistry, recently made a careful exploration and study of the countries on the Eastern Divisions of the Northern Pacific, and published his views in a lucid and comprehensive letter to the *Duluth Tribune*. The following condensed summary of such scientific exploration properly finds place here, as being,

from the standpoint of geological science, probably the clearest, most succinct and most reliable exposition possible of the abundant natural forces of the soils of those countries in their relations to practical agriculture:

"When I first heard of the Northern Pacific Railroad," remarks Prof. Denton, "it seemed as likely to be made as profitable as a road to China through the frigid zone. But after passing over the line" (then built to a point near the western boundary of Dakota) "and examining the soil and crops in its vicinity, I find my ideas of the richness of soil and adaptability of country to man's development in advance of the most extravagant statements. It would be hard to find as large a connected body of good land elsewhere on this continent, where the best food of man can be as readily produced, as that which exists within the boundaries of Dakota, and through the heart of which lies the Northern Pacific Railroad."

After a brief reference to the densely timbered country extending for the first 150 miles west of Lake Superior, Prof. Denton continues:

"From Motley west the soil improves, being either underlaid by limestone, or the limestone countries lying to the north have by glacial agency furnished the soil with valuable constituents. Boulders are comparatively few, and the soil becomes deeper, richer, blacker, every mile till the Red River valley is reached, where the soil is unsurpassed by that of the Nile valley. Here for nearly 50 miles in breadth is exceedingly deep, dark, fine soil"—(meant to include both surface and subsoils)—"and with no boulders or gravel, a remarkable fact in a region so far north, and with boulders lying over the country east, west and south of it."

"When the cold of the glacial period gave place to the present climate, the indications are that the change took place instantaneously, and the great ice sheet then covering this northern region—in some places a mile or more in thickness—was" (by a new inclination of the earth's axis to the plane of its orbit) "suddenly introduced to a temperate climate. Melting in the hot summer suns, it produced a flood, the effects of which are observable to the geologist, from North Minnesota to the Gulf. But such a body of ice melted not in one or a dozen summers. For many years lay the great ice field to the north, preventing the passage of waters in the direction the general slope of the country here would have led them, and thus, as far south as the slope of the land would permit, a lake existed where the Red River valley now is, and gradually enlarged to the north as the ice melted. At the bottom of the lake mud was continually being deposited, produced by the ground-down Silurian, Devonian and Cretaceous beds lying to the north, over which the ice still for many years continued to move, bearing masses of their earthy substances; when it was all melted the dammed-up waters found a natural outlet to Hudson's Bay, and the Red river was formed. Thus in the Red River valley the glacial drift—boulders, gravel, etc.—is covered deep beneath the lake mud, and that mud is now the soil of the country, admirably adapted to the production of grain best fitted to build up the physical system of man."

"From the Red River valley west to the Bad Lands, a breadth of more than 300 miles, is an exceedingly fertile prairie country, destined throughout its entire extent to be a very rich agricultural region. The poorest land anywhere to be found is better than the average of Massachusetts. In some places are large accumulations of glacial material—sand, gravel and boulders piled confusedly together where they had been pushed by the sliding glacier, or left where they had melted out of its mass. But in most of the railroad cuttings—especially nearing the Missouri river—were evidences of the action of large bodies of water, which had modified the drift material, sorting it into stratified beds of sand and gravel;—evidences also that large bodies of water had rested at times on the land, depositing sediment—and beds of *Loess*, very similar in appearance to that of Iowa and Missouri, had been formed—producing soils of great fertility. Masses of ice were floated over the country by the same bodies of water, and as they melted the rock fragments were dropped where they now lie, scattered over the region."

"From the Missouri river westward tertiary beds (coal bearing) underlie the whole region as far as the railroad is completed, —and for hundreds of miles beyond, doubtless,—and evidently have not been planed down by glacial agency. These beds probably extend eastward from Bismarck, but being buried by more recent accumulations, their exact boundary can not at present be ascertained."

"From the Missouri river for about 60 miles west on the line of the Northern Pacific, we find boulders of granite, gneiss and quartzite, diminishing in size and number as we go west, till at the distance named, they disappear from the hills and are found only in the valleys and beds of the streams. In the valley of the Green river, 100 miles west of the Missouri, at Bismarck, I found the last drift fragments where they had been floated on ice cakes and dropped, and beyond this westward for 80 miles, and probably on to the Rockies, no vestige of drift nor indication of glacial action exists. The west part of the United States, except in the high mountain regions, was not covered with ice during the glacial period any more than was Northern Asia. The boulders on the hills west of Mandan (near the Missouri where the Northern Pacific crosses it), and those scattered over the country east of Bismarck, were dropped by floating icebergs passing down the Missouri river, whose waters then resembled a sea. For boulders to have passed over that portion of Dakota, the waters must have stood 500 feet higher than the present level of the Missouri, and they then covered a breadth of more than 100 miles."

THE BAD LANDS OF THE LITTLE MISSOURI.

The Bad Lands of the Little Missouri (the Mauvaises Terres of the early maps) present the most striking and impressive views of natural scenery, and are among the most curious and interesting wonders, along the entire line of the Northern Pacific, or, indeed, on the American continent. They will always remain of paramount interest to the student of nature, the tourist and sightseer. Their physical phenomena, and their origin and formation, are well described and explained in the following extract from Professor Denton's communication previously quoted from:

"From Green river to the BAD LANDS a beautiful prairie extends, wave on wave, for 50 miles. We naturally expect this to continue. Not so. We walk on near the summit of the prairie, and lo! the edge of a great valley, hundreds of square miles of which are visible to us. But such a valley, containing myriads of mounds, buttes, pyramids, pinnacles, forts and turrets! Here are cañons, ravines, gulches and perpendicular precipices; pyramids with brown and blue bases, and vermilion tops, towers with unscalable walls that defy the earth-ransacking geologist,—mounds of all sizes from ant hills to respectable mountains; mounds single, twin, triple and multiple; mounds with yellow bases, white girdles and blood-red caps; mounds green, drab, white, blue, red and mottled; truncated mounds, with mounds on them, mounds beyond mounds, like ocean waves lost in distance; but interspersed with all these are beautiful slopes many acres in extent, green as emerald, and lovely spots covered with fragrant ground juniper, fit carpet for a queen.

"Many strange theories have been suggested to account for these wonderful formations—the Bad Lands. A common one is that the whole valley dropped down owing to a grand convulsion. But the horizontal lines of sand beds, sandstone, clay and shale on the faces of the precipices forbid such explanation. The red appearance of many mounds, mesas and peaks, and the great cindery and lava-like masses lying scattered around, have suggested to others volcanic action. It is certain, however, that the causes are still at work, and the Bad Lands are encroaching on the prairie with every shower.

"The Little Missouri, probably, once ran over a broad sandstone bed into the Missouri river, of which it is tributary, as a broad, shallow stream of pure water, nearly 1,000 feet above its present channel. When the Missouri cut its way back by a fall past the mouth of the Little Missouri, the Little Missouri leaped from its sandstone platform into the channel cut by the Missouri, and commenced to cut its way back by a fall through the underlying beds of what are now the Bad Lands. It probably had a fall at that time of 300 feet. The beds underlying the sandstone being composed of incohesive sand and clay, the river cut through the district of country fast, making a deep cañon. As fast as the main cañon was cut, the streams flowing into the Little Missouri did the same thing; rills running into the streams repeated the process; with every shower the rivulets made smaller ravines, and thus the country was cut into a network of cañons, ravines and gulches. As the process continued these ravines and gulches were cut back till many of them met, and masses were cut off that became mesas, buttes, pyramids and mounds. Mr.

Keith, of the Northern Pacific Engineer Corps, informed me that a small stream, near the Little Missouri, cut back in one season, 40 feet long and 10 feet deep.

"After cutting the first channel of 300 feet in depth, the Missouri deepened its channel 300 feet below that, and a second series of cañons was formed. Again the river channel was deepened, a third series of cañons was formed, and all are, with every shower, cutting further and further back from the river, and forming new pinnacles and mounds.

"On the east side of the Little Missouri, near the railroad crossing, is a precipice nearly 300 feet high, in which are found 24 beds of clay, having an aggregate thickness of 171 feet and 3 inches; 11 beds of sand, aggregating 77 feet; two beds of gravel, 8 feet thick; and ten beds of coal, two of the latter being $4\frac{1}{2}$ and 7 feet in thickness, respectively. From these to top of Bad Lands are frequent beds of coal, some of which are thick enough to work, and must become of great value. Beds of coal that were exposed to air and moisture spontaneously took fire, and burned the clay above them into brick, and, where the heat was very great, into scoria-like masses and bodies of semi-jasper. These, being harder than the sand and clay beds, are left, giving a strange burnt-up appearance to the country. Certain of these beds are still on fire near the Little Missouri.

"On the lignite beds are stumps and parts of trunks of large trees transformed, apparently, into solid quartz. There are thousands of these,—it is difficult to travel without meeting them. Petrified stumps of four and five feet in diameter are quite common, and some are from six to eight feet in diameter. When in place they stand erect in the soil in the position they once grew. There are also many leaf beds. It is a fine locality for obtaining perfect deciduous leaves. Some fossil leaves have been changed by heat to deep scarlet, still having as perfect reticulation on the surface as the growing leaf. The leaf beds indicate that this portion of the Bad Lands belongs to the Pliocene age.

"Though much of the water of the Bad Lands contains sulphate of soda, there are yet many springs of pure water. There is also not a little good land. The pasture is excellent in many places, and many beautiful farms may be made in the Bad Lands country. The grasses are rich, and higher than seen elsewhere. Much of the Bad Lands is barren by excess of what poor lands often need.

"A lake once existed where the Bad Lands now are. Into this, the rivers carried sediment till it became a swamp, and trees flourished till the mass of vegetable matter was made sufficient to form a coal bed. As the mountains to the west rose the land here sunk. Another lake was formed. Sediment being deposited in it, covering the previous deposit of vegetable matter, the lignite was formed. Land and water changed places more than twenty times during the deposit of the tertiary beds. The coal is not equal to the carboniferous formation, but these lignite beds will be found to underlie a large part of Dakota."

POPULATION.

Dakota Territory, the northern half of which comprises much the larger part of the country under consideration, was organized March 2, 1861. The first permanent settlements were made in the southeastern corner of the Territory in 1859. Indian hostilities and the Civil War combined to check immigration, until 1866. The increase of population, as returned by the United States Census from 1860 to 1880, has been as follows:

1860..... 4,837 | 1870..... 14,181 | 1880..... 135,180

The following figures exhibit this remarkable increase of nearly 1,000 per cent. in ten years, more in detail:

	1880.	1870.
Total Population.....	135,180	14,181
White.....	133,177	12,887
Colored, including Indians not under tribal organization.....	2,003	1,294
Native.....	83,387	9,366
Foreign.....	51,793	4,815
Male.....	82,302	8,878
Female.....	52,878	5,303

Of the entire population of the Territory at the close of 1881, more than 30 per cent., or about 52,000 people, reside in the Red River valley and in the counties west on the line of the Northern Pacific, which are now being rapidly settled. Northern Dakota is doubtless destined to receive much the larger per cent. of immigration into the Territory for the next decade at least, and must soon become its more populous half. Of this part of the Territory, the peculiar and remarkably fertile soil, cheap lands, invigorating climate, and the rapid building and development of lines of railroad transportation, combine to offer inducements to immigrants which no other section of the West extends in equal degree.

Dakota has no bonded debt, and the floating indebtedness is small, being, as reported by the census returns of 1880, only \$22,612, with assets of \$85,373. Taxation is low, and the Territorial finances are in excellent condition. The receipts for the last fiscal year were considerably in excess of the expenditures. There are exempted from seizure for debt, \$1,500 worth of personal property, a farm of 160 acres, and a town lot and residence of six acres. A free school law was passed in 1869. The schools are now systematized; under the control of a Territorial Superintendent, and County Superintendents are required to see that common schools are kept open in each county not less than three months of the year.

SURFACE AND SOIL.

The vast extent of country examined by Prof. Denton from the base line of the Northern Pacific, and included under his observations of the Glacial Drift, expands from the regions adjacent to the Bad Lands of the Little Missouri, in Dakota, to the western confines of the timber belt of Minnesota, and from the British boundary to below the 46th parallel—a great territory, more than 400 miles from west to east, and 200 miles from north to south, comprising an area as large as the combined areas of Pennsylvania and Ohio. Of this large territory, except in the valley of the Red river, the surface is rolling upland prairie, interspersed west of the Missouri by the broken and frequently precipitous butte formations, and traversed midway of its extent, from northwest to southeast, by the low and generally narrow chain of the Coteaus. Throughout these vast tracts of country in their entirety, as defined above, *there is a substantial, if not exact, uniformity in soil formation and constituents.* Including the prairies adjacent to the Red River valley on the east, the Red River valley itself, and the far stretch of uplands west to the Missouri and 100 miles beyond, there exists, in respect to character and composition of soil, *the same and generally equal capacity for specific crop production.* It is throughout, as stated and explained by Prof. Denton, a deposit from the Glacial Drift, possessing everywhere an abundance, in some places perhaps a relative superabundance, of the alkaline salts and lime constituents, which have rendered the Red River valley famous for the remarkable and wonderful uniformity and excellence of its cereal production.

Of this entire broad domain only the comparatively small and confined district of the Red River valley proper—about 50 miles in width—has yet become widely and popularly known. It is just to assert that, famous as its name is, even this portion is not generally well understood in its really dominant characteristics of soil, and truly distinguishing quality and capacity of production. In newspaper descriptions and statements, in the selection for publication of exceptional crop yields, in pamphlets designed to set forth the merits of that country, and generally, so far as the writer has observed, too much importance has been given, either by direct affirmation or by necessary inference, to certain points of comparison with

other States and Territories of the West, as to which particular points of comparison Northern Dakota can not fairly claim superiority or special distinction. The impression has been thus created among the public at large who read the current publications referred to, that Northern Dakota (and Northwestern Minnesota is like it) is a country of very deep surface soil, of rank and luxuriant native vegetation, and that its cultivated farms show an unusually strong and dense growth of the cereals. So far is this from being exact that the merely surface soil, that which unites with its original elements decomposed vegetation, and takes on the dark color of vegetable loam, has generally an average not exceeding from 15 to 24 inches in depth. The native grasses, though sufficiently abundant and very rich in nutriment for grazing animals, are not of the rank, tall growth that was frequently found in the once Territories east of the Mississippi, nor in the trans-Mississippi countries below the 43d parallel, nor yet in parts of Eastern Kansas and Nebraska. It needs no concealment that many of those who first knew the Red River valley in its native state—and so late as when the Northern Pacific was about to be extended across it, some ten years ago—thought but poorly of it as a possible agricultural country. It was not then suspected by men who had heard nothing of its successful cultivation by the Canadians across the boundary, to possess the peculiar and extraordinary force and adaptation for the raising of wheat and the small grains which the last six or seven years have so well proved. Nor has experience shown the fields of the Red River valley, nor any of the cropped lands on the same parallels in Dakota, to yield uncommonly largely to the acre. The average production per acre through a series of years has, it is true, been considerably greater than elsewhere in the new States and Territories of the West, but the writer has failed to learn of any select fields of wheat, for example, which have produced as many bushels to the acre as has been known in instances sometimes occurring in the new countries situated more centrally of the United States. The stand of the growing wheat in Northern Dakota is not extraordinarily strong and dense. To claim *distinction* for the country in these particular respects is not sound, and to create the public impression of its superiority on such especial grounds is not correct, and will not be justified by the experience in general of those who go there to engage in farming. While merely in the abundance of vegetable growth for which it is adapted, Northern Dakota is not practically inferior to any of the new countries further south, the conditions of soil and climate and the resulting facts of experience do not in this respect distinguish it above other countries. And practical men who have had observation and experience of new wheat countries, which in their rank native grasses and superabundant first crops, exhibited unusual and remarkable fertility, and have seen them decline surely, and more or less rapidly, in producing capacity, will know that if the claims of the great Northern Wheat Belt rest only on such early and superficial indications, there can be no assurance of comparatively permanent productive power. The writer, unwilling to mislead, or to seem to foster erroneous impressions, which result also in temporary disappointment at least, and are apt to react to the disadvantage of any new country inviting immigration, has thought it proper to be thus explicit in regard to the foregoing points of comparison, before noting briefly the conditions which do in fact distinguish the lands between the 45th parallel and the Canada boundary, as the best wheat belt in the United States. Besides, in any case, it ought not to be otherwise understood. Nature is adapted in all climates to the requirements of animal sustenance. For the spreading and dense luxuriance of vegetation, seek progressively

the central and southern latitudes of American territory; for strength of nutriment, go north.

The conditions which establish the inherent definite superiority of the Northern Wheat Belt over the other wheat lands of the United States are :

1st. THE EXTRAORDINARY PROPORTION OF THE BEST ELEMENTS OF SOIL WHICH ENTER INTO THE COMPOSITION OF THE CEREAL GRAINS.

2d. THE MORE REGULAR, UNIFORM AND RELIABLE CONDITIONS OF SEASONABLE CLIMATE WHICH PROMOTE THE GROWTH AND PERFECT MATURING OF THE CEREALS.

These propositions are well maintained by agricultural chemistry and comparative meteorological data, but, what is better, they are already sufficiently proved by the test of farming operations. They do not depend on theory or speculation, but belong to the facts of experience. The men who go there to engage in farming, relying on these well-ascertained facts, will not be disappointed. The cultivation of the soil by settlers has progressed for a longer time and to a much greater extent in the Red River valley than on the uplands west; but for the past few years it has been spreading westward, has begun to well occupy the first upland counties, is scattered all the way along the Northern Pacific to the Missouri river, is commenced in Morton county, beyond the Missouri, and has been undertaken on the Heart river, in Stark county, 56 miles from the western boundary. The principal crop, and generally the only crop, raised for shipment has been wheat. The average production per acre for the entire country has not been less than 18 bushels, and would be more fairly stated at 20 bushels, considering the facts of inefficient culture, "sod wheat," etc. The average yield per acre varies from 16 to 25 bushels in the Red River valley, and from 16 to 30 bushels on the uplands west. These are very large averages of wheat production, much exceeding, throughout the series of years comprised, the average of any other of the wheat growing countries of the West. This fact of exceptionally large average yield per acre has, more than anything else, created the impression of luxuriance of growth. The stand of the wheat is not, however, as has been stated, more than commonly dense, and the stalk does not grow uncommonly tall, but the heads of wheat fill long and full, and the grain is plump and remarkably solid. The wheat exported from the Territory, superior to No. 1 Spring, and quoted higher in price, has acquired in the market a new designation peculiar to itself, that is, No. 1 Hard.

The valley of the Red river, about 50 miles in width where the Northern Pacific crosses it, contracting south of the line, and gradually broadening above it, is depressed below the line of country on either side, and expanding to the eye a perfect level, seems at first view, by its topography and certain surface indications, to separate itself and be different from the adjoining countries in characteristics of soil. This fact of contrasting topography, having sharply defined limits against the bluff line of the uplands, in connection with the splendid success of wheat culture there, for several seasons before it was commenced in the nearest upland counties, early enabled it to appropriate a reputation for special excellence of production to which it gave its own name—the Red River Valley Wheat. When, however, cultivation extended to the uplands, and it was proved that they possess certainly fully equal qualities of cereal production, the same constituents of soil, the same abundance of mineral salts and lime phosphates, the surface soil having similar depth of calcareous loam—from 15 to 24 inches—and the subsoils of equal character, then the limits of the Red River valley were nominally extended west to the water-shed at the summit of the Missouri slope,

the Coteaus of the Missouri plateau, thus including the districts of the Sheyenne and James rivers. But such defining of its limits is not admissible. The deposits of lacustrine mud are confined to the level surface of the valley between the uplands. The surface indications, boulders and gravel, of the uplands, are in the valley buried deep beneath the mud deposits. The James river runs a little east of south, and empties into the Missouri near Yankton. The Sheyenne, intermediate between the James and Red rivers, runs parallel to the James until, about 40 miles south of the Northern Pacific line, it strikes the incline to the north which dammed up the melting glaciers of old, and formed the lake where the Red River valley now is, and only then do its waters sharply revert to the north and meet the Red river. The truth is, that while the glacial deposits were ground down and deposited as mud over the surface of the Red River valley, and in fragmentary or detached masses on the uplands, the latter have by subsequent disintegration and the agency of water also, everywhere occupied the surface to great depths. Mingled with the decomposed vegetation of ages, they have left throughout Northern Dakota, to the limits of the Glacial Drift, near the western boundary, the same peculiar and abundant elements for magnificent cereal production which are now universally recognized to belong to Eastern Dakota and the Red River valley. Whether similarly favorable soils for the small grains do not exist along the same parallels beyond the Glacial Drift, has not yet been sufficiently tested by agricultural operations. It is pretty certain, however, that such is the fact. But within the limits of the drift formations, science and the data of experience have everywhere established the fact of substantial uniformity of soil.

The uplands of Northern Dakota possess some important practical advantages in which the Red River valley is in localities deficient. These are a better supply of pure water, and better natural drainage. Throughout the countries on the James river, the broad plateau of the Missouri, and beyond to the Little Missouri, there is an abundance of pure, healthful water obtained by wells varying in depth from 12 to 50 feet, though sometimes they require to be driven to a greater depth. Their general average depth is from 25 to 30 feet. The water of the Red River valley is not universally so good. The natural drainage of the undulating uplands is everywhere ample. The slope of the west half of the Red River valley, toward the river, is better and more uniform than on the Minnesota side, where are extensive interior levels and depressions, but, even in the west portions of the valley, a seedling season of unusual copious rains embarrasses, in some localities, the planting and germinating of the grain.

FARMING.—The wheat grown in Northern Dakota is spring wheat. The variety most commonly used for seed is the Scotch Fife. The great general excellence of production is evidenced by the fact that considerably the larger per cent. of wheat grown in any one year in Northern Dakota grades in the market as No. 1 Hard. In some years the proportion has been as high as 85 per cent. of the entire crop. It commands about 10 per cent. higher price in the market than the No. 2 Spring of the Chicago Board. The average price received by the producer, at the stations along the line of the Northern Pacific, has usually been from 80 to 90 cents per bushel. The crop of some seasons, of course, brings a higher price,—for that of 1881 the farmers obtained an average of from \$1.10 to \$1.15 per bushel. As is well known, many very large farms, consisting of thousands of acres in one body of land, are conducted in Northern Dakota. This class of estates in crop are known as the Bonanza farms. From the experience on the Bonanza farms, where all the

labor is hired, it is found that a first crop, including breaking, backsetting (second plowing), seed wheat, sowing and harrowing, harvesting, threshing and delivery at granary, costs about \$11 per acre, and that the cost of subsequent crops is about \$8 per acre. Given an average of 18 bushels to the acre, and the cost of a bushel of wheat delivered to market on the Bonanza farms does not, after the first year, exceed 45 cents. It is a moderate statement, and not in excess of probable results, to affirm that the immigrant who goes to Northern Dakota and locates upon a small farm, ought not, with common energy and fairly good management, to fail to realize a profit of from 40 to 45 cents a bushel in an ordinarily fruitful year, when wheat is worth 85 cents at the local elevator. Or, to put the statement in another form: 100 acres in wheat ought, after the first crop, under the average of farming conditions in Northern Dakota, to return a profit of from \$700 to \$800.

As has been stated, wheat is the principal crop. It has in fact been so far almost exclusively the crop marketed. It will doubtless remain the chief crop for many years. Though of all the cereals the shyest bearer, it commands so much higher price than any other, the cost of transportation is so much less as compared with value, the possibility of over-production in the wheat-growing countries in any year so remote, and its cultivation in Northern Dakota has been so satisfactory, and lucrative indeed, on account of the *quality* and *reliability* of the crop, that it will doubtless for years to come allure the attention of the farmers from more general and varied cultivation of their farms and improved lands. It can not of course be claimed that the Northern Dakota wheat lands will never deteriorate and wear out under the unremitted cultivation of wheat. But on precisely similar lands, in the Selkirk settlement of Manitoba, wheat has been grown for thirty years successively without fertilizers, and the crop is said to still maintain its excellence of quality and large average yield. It is certain that seven or eight years of continuous cropping in Northern Dakota, have not yet anywhere visibly diminished the wheat producing fertility of the fields. So exceeding is the abundance of wheat constituents in the soil. While the wheat crop continues to be of such superior quality and so reliable, it is probable that the allurements of large profits from the "King of the Cereals"—the haste to get rich, which is the ruling propensity of American life—will postpone the day in Northern Dakota and mid-western Minnesota of more economical methods and less extravagance in farming. That waste without restoration will not in time degrade the old wheat fields of Northern Dakota can not be hoped. But it is certain that by the superabundance of their natural forces they can sustain such a course of extravagance without decline of production for a greater length of time than has been known, or is possible, south of the great Northern Wheat Belt. This proves or asserts nothing in palliation of wasteful practice. Public economy, on the other hand, demands that a country of such very remarkable excellence in the production of the great staple, wheat, should be carefully preserved from degradation of soil. But the writer seeks not to advise. His mission is to state the facts as he finds them. The other small cereals, oats, rye, barley, etc., exhibit the same excellence of quality in Northern Dakota as wheat. Oats grow even in relatively larger average quantity to the acre than wheat. The vegetables, potatoes, onions and all the roots are also of remarkable excellence, abundance and size.

The qualities of climate which bear on wheat raising in Northern Dakota, and contribute more regularly, uniformly and efficiently to the growth of the crop than more southerly climates, are, more daily sunshine,—the days, by reason of the higher latitude, being longer—less intense heats during the maturing months,

fewer injurious caprices of weather at the critical period of growth, and the cool nights which not only favor the crop, but are so desirable to the tillers of the soil after the labors of the day. The wheat crop is harvested in about 100 days after seeding.

It is doubtful whether the special varieties of field corn (maize) which are so luxuriant in Illinois and Iowa are practicable in Northern Dakota. The soil is doubtless not so well adapted to them, and the distinctive facts of climate which promote the wheat crop are at the same time opposed to the rapid and luxuriant growth of corn. The corn crop of the middle latitudes has the warm, sultry nights of July and August which so strongly stimulate its rapid maturing. These are lacking in Northern Dakota, and the frosts are rather earlier. The hardy variety of corn, the yellow flint, does fairly well along the line of the Northern Pacific, and yields from 40 to 75 bushels to the acre.

CLIMATE.

Enough has been said of the climate of Northern Dakota in its relations to special agricultural production. This class of facts needs but little elucidation. The exceptional adaptitude of the climate to the small cereals will be generally recognized by intelligent men everywhere as the gift of nature to the great Northern Wheat Belt, whether they know anything of practical agriculture or not. They know enough of the great cereal, wheat, and its kindred grains, to be fully aware of the general fact that these flourish best, and find their best home in the northern latitudes of the temperate zone.

But the climate of Northern Dakota, so far as it concerns comfort and salubrity of residence for man, is very widely and popularly misunderstood. One sharp contrast may serve to best bring into prominence, and best enable the reader to conceive the dominant conditions of climate as a residence, which are most important as bearing on the settlement of the Northern Belt, between Lake Superior and the eastern slope of the Rocky mountains, and the capability of climate to sustain a strong, compact and progressive population. And the contrast will not be inappropriate as bringing into designation two great areas open to immigration. Emigration, it is well known, pursues a natural preference, and seeks identity of latitudes. For this reason, and because the first trans-continental railroad, and its connections, entered and crossed the middle portions of the country, it resulted that the middle portions of the great West were the first to be occupied. Population is greater to the square mile in the middle agricultural sections of the West than on the north or south. So far as relative unoccupancy is concerned, the northern and southern portions are more open to immigration than the middle. To illustrate differing effects of climate on the physical energies of men, contrast Northern Dakota with the Texan plains. Of the two, the northern climate stimulates and strengthens the physical energies of men. The southern climate enervates and weakens them. In the northern climate, the bodily activities are encouraged and re-enforced. In the southern, they are dispirited and reduced. In the climate of Texas the disposition and power for manual labor is rendered languid and prostrate. In Northern Dakota they are reinvigorated and re-erected. Under the subtle influence of climate in Texas, men do, in spite of themselves, incline to inaction and repose. In the stimuli of Dakota's eager and zestful atmosphere, they are roused to movement and action. The emigrant from any of the Northern States who goes to Texas resolved to infuse into his chosen occupation there, the spirit of energy and

activity common to Northern business life, invariably finds himself in a year or two being gradually and surely overcome by the influence of the climate, and soon gives himself up to the same indulgence in sensuous ease and physical inactivity which characterizes the people among whom he has adopted his home. The emigrant from Iowa or Illinois, for example, who goes to Northern Dakota, sees everywhere the greatest activity of business movement, the sharpest competition of effort; finds work and labor of all kinds on farm, in shop, in field or town, never languid and slow, but prompt with the morn, and undepressed at close of day, and himself feels the same stimulus to alert and vigorous activity which inspirits the country and the people.

This brief statement of contrasting climatic effects, well known to be true by intelligent men, whether they have ever visited either country or not, makes sufficiently clear and distinct—what is the most important consideration of climate in any new country—the advantages of climate in Northern Dakota to nurture a strong and energetic race of men, to sustain compact and prosperous communities, and to build up the progressive and advanced civilization which human effort, under favoring conditions, so magically transfers to the new Territories of the United States. The American emigrant is not a sybarite. What the emigrant wishes to know of a new country, is not whether it invites to sensuous enjoyment, but whether it promises health for himself and his family, and affords such conditions in general as will soonest enable him to enter on a career of successful effort and to acquire the means of independence. No climate is more healthful than that of Northern Dakota. There is far more general exemption from malarious germs and malarious diseases there, than in the middle and southern countries of the United States. And there are in Dakota the qualities of climate in all seasons of the year which permit and support sustained physical activity. There is in Northern Dakota sometimes very cold weather in winter, and sometimes very warm weather in summer. But it is never cold and damp in winter, nor ever hot and sultry in summer. It is a dry atmosphere. The winter cold is of very different character from that of the saturated atmosphere of the Atlantic coast, and the humid atmosphere of the middle interior sections, and is comparatively much less chilling and more tolerable. That is to say, the degree of cold which would be quite intolerable on the Atlantic coast, is easily tolerable in Northern Dakota. In the coldest weather there, the atmosphere is also generally still and motionless, and out door labor or exercise is endurable without great discomfort. The worst and only really impracticable weather along the Northern Pacific is the occasional blizzard, a violent wind-storm accompanied by blinding snow,—which is, in fact, of no more frequent occurrence there than elsewhere in the West. So far as concerns the mere pleasure of a winter residence in Northern Dakota as compared with that in more southerly climates, the only valid objection which can in truth be stated, is the length of the cold weather, which is liable to endure from November to April. This statement must not be taken as absolute, but as indicating a comparative average only. During last winter, that of 1880 and 1881—a cold, rigorous winter in the West—the lines of railroad south of the Northern Pacific were snow-bound and frozen up for weeks, extending into months in some districts, while the regular movement of trains on the Northern Pacific was not seriously obstructed a single day. The present dry, sunny and altogether mild winter in Northern Dakota has been much more desirable than the condition of the weather in Central and Southern Iowa, for example, where have been a great number of gloomy, lowering days. At the very date of writing, the 17th of February, 1882, the ice

in the Missouri, at Bismarck, is weak and commencing to break up; the surface of the ground on the Missouri plateau is free from frost and perfectly dry, and many fields have been, within the past week, seeded for the crop of the ensuing season.

On a fair summary of the conditions which best conduce to success in farming, it can be justly claimed that there is no new agricultural country remaining in the United States where wealth may be so easily and quickly produced from the soil, (which also assures prosperity for men of all occupations) as in the country tributary to the Northern Pacific, from the eastern limits of the Red River valley to the approaches to the Little Missouri. This does not importantly depend on the greater quantity of cereal production to the acre. Though the fact of generally greater average production obtains in Northern Dakota, it is still not so important a factor as has been commonly represented. It will be most considerably due to the remarkably superior *quality* of the cereals, and to the greater *reliability* of wheat production. There is unquestionably an exceptionally fortunate joint contribution of soil and climate throughout the countries mentioned, to ensure long successive annual harvests of comparatively little varying quantity and quality. There is definite assurance of more perfect and enduring wheat production in those countries than is elsewhere known.

MIDDLE AND EASTERN MINNESOTA.

The country along the Northern Pacific for 150 miles east of Lake Superior, and across the Wisconsin Division to Montreal river, is densely timbered, abounding with pine of various species, having in places an intermixture of oak, maple, birch, ash and elm. The region is more or less sandy, the surface soil being a sandy mold, having in places a good or fairly retentive subsoil. The surface is in localities swampy, there being no great inclination for the waters to flow off. It is not cultivated except in a few sparse and comparatively unimportant clearings. The aggregate population of the counties in Minnesota along this section of the line, excluding Morrison county, does not at present exceed 14,000, and is nearly confined to Superior, Duluth, Brainerd, and the other towns and stations on the railway. Professor Denton states, that all, or nearly all, of this district of country is underlaid by Potsdam sandstone; and that the action of the great glacial sheet, passing over it from the northeast, has ground down the sandstone and distributed it over the country, giving it its peculiar character for the growth of pine. Until the vast fertile prairies on the west are well occupied, this densely timbered section is not likely to be extensively cleared by settlers and the land subdued. It does, however, contain much good, strong land, and it is probable that the largest part of it can be well adapted to agriculture. It is well watered by numerous lakes and many running streams. Here and there are interlying meadows covered with a dense, tall growth of blue joint, red top, and the coarser meadow grasses, yielding from one to two tons of hay per acre. The region must be, for years to come, chiefly valuable for its lumber, timber and wood supplies, for which its location is specially valuable and opportune to the unwooded western prairies traversed by the Northern Pacific. The forests of this extensive district abound with deer and smaller game, and the lakes are stocked with the common varieties of hard fish. The streams and brooks in the northern part are the homes of magnificent trout. The region is a famous resort for hunters and sportsmen.

WATER POWER.—The Falls and Rapids of the St. Louis river, not yet improved, but soon to undergo extensive improvement and to be utilized for manufactures, are estimated, on approximate measurements, to afford an aggregate of economically available hydraulic power not much less than that of the Falls of St. Anthony at Minneapolis, which have enabled the latter city to become one of the more important manufacturing centres of the United States. The St. Louis Falls and Rapids water powers extend up the river from its discharge into the bay of that name at the head of Lake Superior, a distance of some ten or more miles, which fact of location is all important, affording as it does, for manufactured exports, the cheap transportation of the Great Lakes. This section on the Northern Pacific from Thompson to Superior and Duluth will, doubtless, soon become the theater of extensive manufacture of flour, as it is already fast supplanting Minneapolis itself in the manufacture of lumber.

MANUFACTURES.—The only manufacturing enterprise, so far, importantly entered upon in the Lake Superior District, is that of lumber. The lumber mills are operated by steam power, the mill waste furnishing ample supply of fuel. The cutting off of the pine timber near the margins of the larger streams conveniently tributary to the Mississippi, and the consequently increasing cost and difficulty of rafting for the Mississippi drive, has hastened the establishment of extensive saw mills in the pine region, which is now rendered better available by railway transportation. In the Lake Superior District are now some of the largest lumber mills in the United States; that of the C. N. Nelson Lumber Company, having a capacity of 225,000 feet per diem, is claimed to be the largest saw mill in the world. The aggregate lumber product, for the season of 1882, of the Lake Superior District, will, it is estimated, not be less than 175,000,000 feet. The vicinities of Lake Superior in North Eastern Minnesota and Northern Wisconsin abundantly contain iron ores, which yield a quality of metal not inferior to the best Swedish iron. The copper ores of the region are of exceeding purity.

The Northern Pacific has outlets on the furthestmost head of Lake Superior, at two points, situated on opposite sides of the long, narrowing indentation formed by the lake—Duluth on the north, and Superior on the south shore, distant but a few miles apart. Superior is on the main line of the Northern Pacific, and Duluth is the terminus of the line from North Pacific Junction, owned and operated in common with the St. Paul & Duluth Railroad. Duluth has already become an important commercial point, especially in the transfer and handling of grain, coal, etc. The Northern Pacific was completed to Superior at the close of 1881. The approach to the lake at Superior is by easier gradients than at Duluth. Superior has advantages of position, being on the route of easier and more direct accessibility to lines of railway from the south and east, and possesses, also, a more spacious harbor. During the coming season important water-front improvements will be commenced at Superior. Wharfs and warehouses will be built, and an elevator of a million bushels capacity will be erected.

It is apparent that a city of high class must be built up at the head of Lake Superior. The completion of the entire line of the Northern Pacific across the continent, and the resulting settlement of the countries on that parallel, demanding an outlet for their products and an inlet for supplies by way of the Great Lakes, must create a very important commercial city at the head of Lake Superior, the entrepot of a vast distribution and interchange of goods and products. The material resources for large manufacturing enterprise are also abundant.

DEMAND FOR LABOR.

The demand for labor in the countries now undergoing settlement on the line of the Northern Pacific is active. Wherever settlement has commenced and the lands are being converted into farms, towns and villages are rapidly springing up, in which the work of building and improving creates abundant opportunities for both common and skilled labor, at better average wages than in older communities. The skilled or trade labor of mechanics, artisans, etc., scales from \$2.50 to \$5.00 per diem, according to trade, or work. Common labor receives an average of \$1.50 per day. The farming operations of Dakota, often on a larger scale than elsewhere, require to a much greater extent than is usual in older farming communities, hired labor in all the work of the farm. Many farms too are conducted by men whose regular occupation is in town, and these employ hired labor for all farm work. In the spring months the wages paid farm labor are \$18 or \$20 per month and board; during the cutting of the grain from \$2.25 to \$2.75 per day and board; in the threshing season not less than \$2.00 per day and board; and for fall work till the ground freezes up, \$25 to \$30 per month and board. The advantages which laboring men secure by going to Dakota do not so much consist in prompt employment at an advanced rate of wages, as in the many opportunities to early establish themselves in more independent situations in life. Their proximity to desirable choice of the public lands also enables them to acquire from 160 to 320 acres of valuable government land, which the proceeds of their labor will easily enable them to make the necessary improvements upon, and at the same time support themselves.

LAND GRANT OF THE NORTHERN PACIFIC.

The Land Grant of the Northern Pacific was conferred by the Act of Congress which created the corporation. The Act donated to the Company by its terms, "every alternate section of public lands, not mineral, designated by odd numbers, to the amount of 20 alternate sections per mile, on each side of said railroad line, as said company may adopt, through the Territories of the United States, and 10 alternate sections of land per mile on each side of said railroad wherever it passes through any State." It was also subsequently enacted by Congress, that if, by previous occupation and settlement, under the laws of the United States, or from other cause, the company can not get the quantity of land to which its charter entitles it, it may make up the deficiency within a prescribed limit on either side of its original Land Grant limits. This is known as the indemnity limit. The route of the railroad, for which a right of way of 200 feet on each side of the track was granted through the public domain, was enacted to be above the 45th parallel, on the most eligible route between Lake Superior and Puget Sound, via the valley of the Columbia river, with a branch to Puget Sound across the Cascade mountains.

The Land Grant of the Northern Pacific thus comprises 25,600 acres for every mile of its line in the Territories, and 12,800 acres for every mile of its line in the States, on its entire route, as generally enacted by Congress, between the Great Lakes and the Pacific ocean. There have been approved by Presidents Grant, Hayes and Arthur several lengths of the completed road, making a total, in December, 1881, of 1,005 miles. The title to the granted lands coterminous with the completed and approved sections of the road, is vested in the company by

patents from the United States. With respect to the granted lands on the uncompleted sections of the road, the question was raised in the Interior Department on the occasion of the filing of a map of amended line, in May, 1879, whether the grant had not lapsed by reason of the failure of the company to complete the road within the time specified in the Acts of Congress relating thereto, and, if so, whether the Department can recognize any acts by the company looking to the institution of new rights or the enlargement of old ones. These questions were finally referred from the Interior Department to (then) Attorney-General Devens, who held that the grant must remain as it existed on the day when it was made and accepted by the company, until such time as Congress, by express Act, shall declare a forfeiture of the grant. In accordance with this view, and with the ruling of the Supreme Court of the United States in the case of *Schulenburg vs. Harriman* (21 Wallace, 44), Secretary of the Interior, Hon. Carl Schurz, promulgated the decision of the Interior Department, dated July 11, 1879. No power but the Congress of the United States can dispossess the Northern Pacific of the unearned portions of its Land Grant, and until such hostile legislation by Congress, the entire grant remains in full force and effect. But in the rapid building of the unfinished portions of the through line now progressing, such adverse legislation is not to be feared.

The company has disposed of about all its prairie lands west of the Minnesota timber belt as far as to the 99th meridian, or something more than 100 miles west of the Red river. This limit includes a district of the Land Grant in Dakota, comprising the lands of the company in Traill, Cass, Richland, Griggs, Barnes, Ransom, Foster, and the east half of Stutsman and La Moure counties. West of the 99th meridian, which divides Stutsman county, only the lands immediately on the line of the railroad are mostly sold as far west as the Missouri river. But the far greater part of the Land Grant in the Missouri plateau, extending from the Coteaus near the 99th meridian to the Missouri river, a breadth of 75 miles, and comprising one of the most desirable sections of Dakota, is still unsold. Beyond the Missouri river to the Montana boundary but few lands have as yet been sold, agricultural settlements having been commenced there only within the last two years. The agricultural lands on the Yellowstone Division are but just coming into market. Also but a small fraction of the company's lands have yet been disposed of on the Pacific and Pend d'Oreille Divisions of the line. All the patented lands of the company west of the Missouri River to Puget Sound are at present held at the rate of \$2.60 per acre. Inquiries for more particular information, concerning the lands of the company, will receive the prompt personal attention of the Land Commissioner of the Northern Pacific, at St Paul.

The following are abstracts of the several land laws of the United States:

THE HOMESTEAD ACT.

To obtain a homestead, the party must, in connection with his application, make an affidavit that he is over the age of twenty-one, or the head of a family; that he is a citizen of the United States, or has declared his intention to become such; and that the entry is made for his exclusive use and benefit, and for actual settlement and cultivation, and must pay the fees, \$18. After having resided upon and cultivated this land for a continuous period of five years, the settler will go before the proper land officers and make proof of such residence and cultivation, paying the further fee of \$8, when a patent will be issued to him and his title completed.

Any contract to convey a portion or the whole of his claim before making final proof, destroys his rights. He must not be absent to exceed six months at any one time. An abandonment of claim or a change of residence works a forfeiture. An unmarried woman may take a claim, and if she marries, a continued residence on the land will give her title in her own name. Any time after six months of actual residence, the occupant may, if he prefers, make final proof and pay for his land at the rate of \$2.50 per acre if within the Northern Pacific Land Grant limits, or \$1.25 if without.

Thus under the Homestead Act any man may become the owner of 160 acres of land at a total cost to him of \$26. At the end of the five years required residence an improved farm of 160 acres, situated anywhere in the Northern Pacific agricultural countries, could not fail to be worth \$10 an acre.

Soldiers and sailors who served during the late war of the rebellion, may deduct the time of such service (not to exceed four years) from the five years residence required of the others; thus a man who served three years, will have to reside on his homestead but two years in order to secure a patent. This benefit is extended to widow or minor orphan children of such persons as would have been entitled to the same.

Soldiers or sailors, as above, may file their claims for a tract of land through an agent, after which they have six months in which to remove and make residence upon the land. Thus a soldier who wants to secure an immediate selection, and can not come on at once to do it, can send a power of attorney to an agent here, who can select the land and file upon it, and the soldier so sending, can wait six months before coming on himself.

All persons, except the class last mentioned, must make their application in person at the United States Land Office.

All lands obtained under the homestead laws are exempt from liabilities for debts contracted prior to issuing of patent therefor.

THE PRE-EMPTION ACT.

Under this act the qualifications of the applicant require him to be a citizen of the United States, 21 years of age, or the head of a family. A foreigner, who has taken out his first papers, is qualified under the law. The pre-emptor can take 160 acres, and within 90 days after making his settlement, he must file at the local land office a notice, giving the boundaries of his claim, according to the government survey, and the date of his settlement or first improvements. For this filing he must pay \$2. It may be a plain statement of the facts, written by himself and sent in by mail. Within 33 months from the date of his settlement the claimant must submit his final proof. He must show both a residence on and cultivation of the land for agricultural purposes—a habitable dwelling, and an amount of other improvements, like plowing, stable, well, etc.—that will be satisfactory to the land officers and evidence a compliance with the spirit of the law. There is no definite valuation, as a minimum, described by the law. The financial circumstances of the pre-emptor, the area claimed, and the quality and general character of the land are considered in determining the sufficiency of the improvements. The time of settlement and actual residence are strictly inquired into. After six months of actual residence, the pre-emptor may submit his final proof of the requisite improvements. He must appear in person at the land office and give his own testimony, and produce two creditable witnesses who will swear to the same facts. If the witnesses live at a distance, and their presence would be

both expensive and inconvenient, their affidavits may be taken before any officer qualified to administer an oath under the Territorial laws. Upon making his final proof, the pre-emptor may pay in cash, military land warrants, Supreme Court or Louisiana scrip. Within the Northern Pacific land limit, which is practically 100 miles in width, the pre-emptor pays \$2.50 per acre, or \$400 for his 160 acres. If outside of that limit, he pays \$1.25 per acre, or \$200. Any time before the 33 months expire, the claimant may convert his claim into a homestead by making application at the land office and paying the homestead fee. No person, who quits or abandons his residence on his own land in the same State or Territory, or who owns 320 acres of land anywhere, is entitled to the benefits of the pre-emption law. These disabilities, however, do not apply to the homestead or timber culture act. The privileges of all these acts can not be duplicated or repeated. Claims, before the perfection of title, are not transferable.

THE TREE CULTURE ACT.

The Land Office fee under this act, upon making an entry, is \$14. The applicant is entitled to enter 160 acres on any section naturally devoid of timber. It must be the whole section that is barren of timber, and not the 160 acres merely. Only one tree claim can be taken on a section. It takes eight years to acquire title, but actual residence is not requisite.

The party making an entry of 160 acres, under the provisions of this act, is required to break or plow five acres the first year, and five acres more the second year.

The five acres broken the first year he is required to cultivate during the second year, and to plant in timber seeds or cuttings during the third year. The five acres broken the second year he is required to cultivate during the third year, and plant to timber seeds or cuttings during the fourth year.

Not less than 2,700 trees, seeds or cuttings must be planted on each acre, and at the time of making final proof there shall be growing not less than 675 living and thrifty trees to each of the 10 acres.

The final proof can be made, and patent obtained from government, eight years from date of first entry, and the fees are \$4 when final proof is made.

Land taken under this act is exempt from execution, and from taxation for eight years.

The following answers to inquiries directed to the Register of the United States Land Office, at Fargo, D. T., give late information as to Government lands in that district:

UNITED STATES LAND OFFICE,

FARGO, D. T., January 18, 1882.

SIR,—In reply to your inquiries of the 12th inst., we answer as follows:

“1st. The extent of your (this) land district?”

Ans. All of Townships, Nos. 130 to 148 inclusive, extending from the Red River of the North, west up to, and including, No. 66 west of the 5th principal meridian, being all of the counties of Traill, Cass, Richland, Ransom, Barnes, Foster, La Moure, Dickey and Stutsman, except Ranges Nos. 67 and 68 of the last-named county.

“2d. Number of acres of Government land taken during year 1881?”

Ans. 1,164,480 acres were taken during 1881.

“3d. In what locality, principally, have these lands been taken?”

Ans. A strip of land, 24 miles in width, on either side of the line of the Northern Pacific Railroad, in Traill county, Richland county, and along the James and Sheyenne rivers.

"4th. What proportion by homesteads, pre-emptions, timber culture?"

Ans. Homestead entries, 2,058; acres, 329,280. Timber culture entries, 1,308; acres, 209,280. Pre-emptions entries, 1,736; acres, 277,760. Cash and final proofs entries, 1,916; acres, 306,560. Soldiers' declaratory statements entries, 260; acres, 41,600.

"5th. What amount of Government lands in your (our) district remain untaken (actual or approximate)?"

Ans. About two-thirds remain untaken.*

Very respectfully,

HORACE AUSTIN, Register,

The Bismarck Land District, having an area of 51,000 square miles, as large as the State of New York, extends east and west 250 miles, and nearly the same distance north and south. It includes the whole of the Missouri plateau lying between the range of Coteaus and the Missouri river, and all the region west of the Missouri to the Montana boundary, from the 46th parallel on the south to the British Possessions on the north. But a very slight and insignificant portion of the public lands in any part of the Bismarck Land District has yet been taken. Mr. J. A. Rea is Register of the land office at Bismarck, who will promptly answer all inquiries by correspondence. There is certainly no other section of the vacant public lands of the United States to which immigration can be more confidently invited. It undoubtedly possesses great natural resources to assure the prosperity of the settlers. Large districts of especially valuable agricultural lands within it are already brought into communication with market by the Northern Pacific Railroad, and in the near future, lines of railway traversing the country in different directions will greatly add to its commercial facilities.

COUNTY EXHIBITS AND MAPS.

The maps and accompanying brief exhibits of the progress and growth of the counties nearest the line from the confines of the Minnesota timber belt, to the Montana boundary, will afford more detailed information, and a better understanding of the open and rich agricultural countries widely extending north and south on the eastern divisions of the Northern Pacific, and of their extraordinary resources of production. The first two counties, Wadena and Todd, will sufficiently illustrate the soil of the timber belt, which extends for 190 miles west of Lake Superior, but in its greater density only for 140 miles. The first seven counties Wadena, Todd, Morrison, Becker, Ottertail, Clay and Wilkin, are in Minnesota.

WADENA COUNTY.

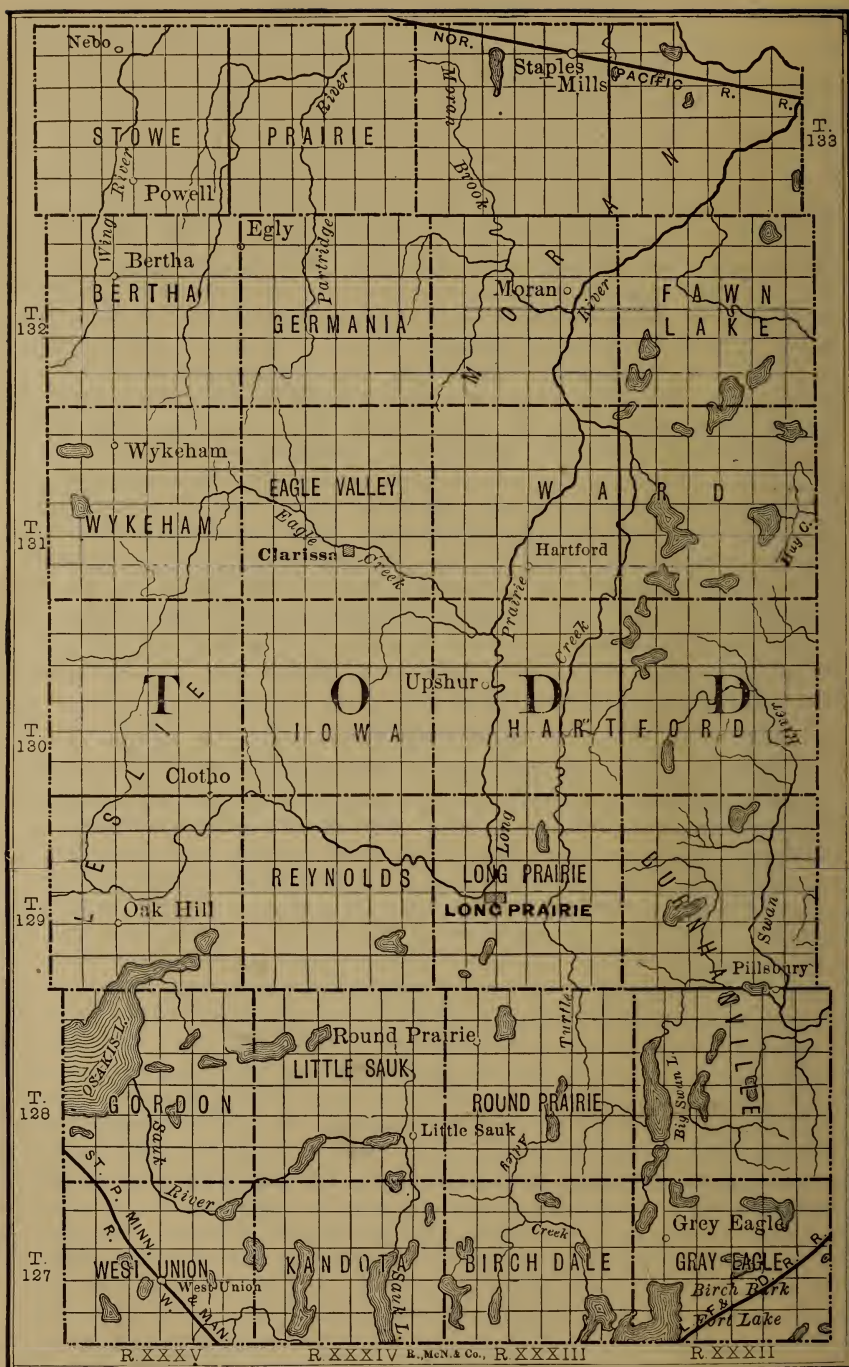
Wadena county lies wholly within the timber belt, but outside its denser portions. About three-fourths of the county is timbered. The county is well watered by numerous small streams. Interlying as openings in the timber are open glades of

* The district embraces 8,000,000 acres, of which about 4,000,000 were railroad lands. Of the public lands title has been perfected by settlers to 700,000 acres. The remainder of the third mentioned as taken has been filed upon, but proofs are not yet made.

smooth prairie, sufficiently undulating or inclined for good drainage. The soil is a black sandy mold, is similar to but better than that of the districts on the east, and is proved to be very productive. Wadena county contains 339,585 acres: forest, 75 per cent.; prairie, 25 per cent. The varieties of timber are pine, oak, birch, maple, ash, elm and linden. The whole number of farms in 1881 was 266, an increase of 34 from previous year. The whole number of acres under cultivation in 1881 was 8,857, an increase over the previous year of 2,584 acres. During the last crop season there were in wheat, 6,574 acres; in oats, 1,412 acres; in corn, 398 acres, and in barley, 100 acres. The average yield per acre for the joint years of 1880 and 1881 was, of wheat, 16 bushels; of oats, 35 bushels; of corn, 30 bushels, and of barley, 28 bushels. The cut of wild hay in 1881 was 2,500 tons. The joint wool clip of the last two years was 762 pounds. The joint product of butter manufactured was 36,485 pounds. Of stands of bees, in 1881, were 15, producing 475 pounds of honey. The yield of potatoes in 1881 was more than 20,000 bushels, or more than 100 bushels to the acre. There were 400 gallons of sorghum produced in 1881. Of orchard trees in bearing in 1881, were 41; not in bearing, 570. The whole number of farm animals in the county is 1892,—593 horses; cattle, 1,004, of which 425 are milch cows; 55 mules; 1,265 sheep, and 835 hogs. There are 14 school houses in Wadena county, seven frame and four log. The total valuation of all property for tax purposes, as last reported by the Auditor of State, was \$364,309, and the rate of taxation three per cent. The population of Wadena county is 2,300. Wadena, near the western line of the county, is the county seat. At this point the Fergus & Black Hills Branch of the Northern Pacific meets the main line. The Northern Pacific Railroad crosses the southwestern part

TODD COUNTY.

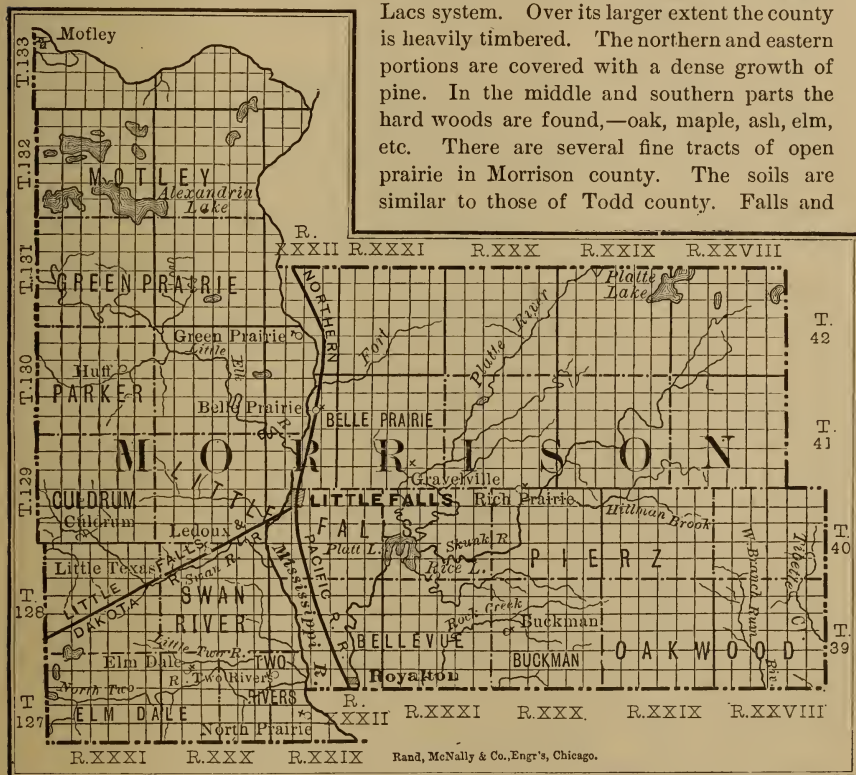
Todd county lies immediately south of Wadena, and like it, is wholly included in the western portion of the timber belt. Todd is well watered by running streams, and contains a number of handsome lakes. The character of the soil is a black, sandy loam. It produces well. Many of the timber openings occur similarly to those in Wadena. There are, however, more extensive reaches of prairie in Todd county. The county contains 576,980 acres of land: forest, 65 per cent.; prairie, 35 per cent. The varieties of timber are the same as in Wadena, with a larger proportion of the hard woods. The whole number of farms in 1881 was 848, an increase of 36 from previous year. There were under cultivation in 1881, to the principal crops, a total of 18,408 acres, of which there were 12,357 acres in wheat; in oats, 3,418 acres; in corn, 1,076 acres, and in barley, 227 acres. The joint average yield per acre in the past two years of 1880 and 1881 was, of wheat, 14 bushels; of oats, 35 bushels; of corn, 28 bushels, and of barley, 23 bushels. The cut of wild hay in 1881 was not less than 13,000 tons. The joint wool clip for the two years, 1880 and 1881, was 11,594 pounds. The joint product of butter manufactured was 232,345 pounds. Of stands of bees in 1881 were 175, producing 4,500 pounds of honey. The yield of potatoes was more than 40,000 bushels, or about 85 bushels to the acre. Of sorghum, 1,800 gallons were produced. The number of orchard trees in bearing in 1881 was 793; growing, and not bearing, 3,570. The whole number of farm animals in the county is 11,335, of which 1,707 are horses; 6,325 cattle, of which 2,341 are milch cows; 66 mules; 1,821 sheep, and 1,416 hogs. There are 58 school houses in Todd county, 19 frame and 39 log. The total valuation for tax purposes, as last officially reported, was \$1,216,733, and



the rate of tax, 21 mills. The population of the county is about 6,700. Long Prairie is the county-seat. The Northern Pacific crosses Todd county in its north-eastern corner. The Little Falls & Dakota Branch of the Northern Pacific traverses the southeastern part.

MORRISON COUNTY

Adjoins Todd county on the east. The Mississippi river crosses it nearly midway, from north to south, and the whole surface of the county is crossed and intersected by numerous small tributaries of the great river. In the northeast part are various lakes belonging to the Mille Lacs system. Over its larger extent the county is heavily timbered. The northern and eastern portions are covered with a dense growth of pine. In the middle and southern parts the hard woods are found,—oak, maple, ash, elm, etc. There are several fine tracts of open prairie in Morrison county. The soils are similar to those of Todd county. Falls and



rapids of the Mississippi occur at intervals, affording abundant water power, the most important of which, for manufacturing purposes, is at Little Falls, the county seat. The Northern Pacific branch railroad to Minneapolis and St. Paul follows the Mississippi river across the county. The Little Falls & Dakota Railroad, having its initial point at Little Falls, traverses the middle-western townships.

The entire land area of Morrison county is 698,577 acres: forest, 75 per cent.; prairie, 25 per cent. The whole number of acres under cultivation in 1881 was 27,450. The whole number of acres in wheat was 19,454; in corn, 1,602 acres; in oats, 5,019 acres, and in barley, 410 acres. The joint average production for the years 1880 and 1881 was, of wheat, 17 bushels to the acre; of corn, 30 bushels to the

acre; of oats, 35 bushels to the acre, and of barley, 30 bushels to the acre. More than 10,000 tons of wild hay were cut in 1881. The whole number of farm animals in the county in 1881 was 9,182: horses, 1,615; cattle, 4,913, of which 1,911 were milch cows; 62 mules; 965 sheep, and 1,627 hogs. The wool clip was 3,100 pounds; the product of butter manufactured was more than 90,000 pounds; of cheese was 1,500 pounds. There were 160 stands of bees, producing 4,300 pounds of honey. Apple trees in bearing in 1881, 251; growing, 1,276. From 431 acres were produced 44,000 bushels of potatoes. There are 29 school houses in the county, 12 frame, and 17 log. The population of the county, as returned by the census of 1880, was 5,875. It is now about 6,600.

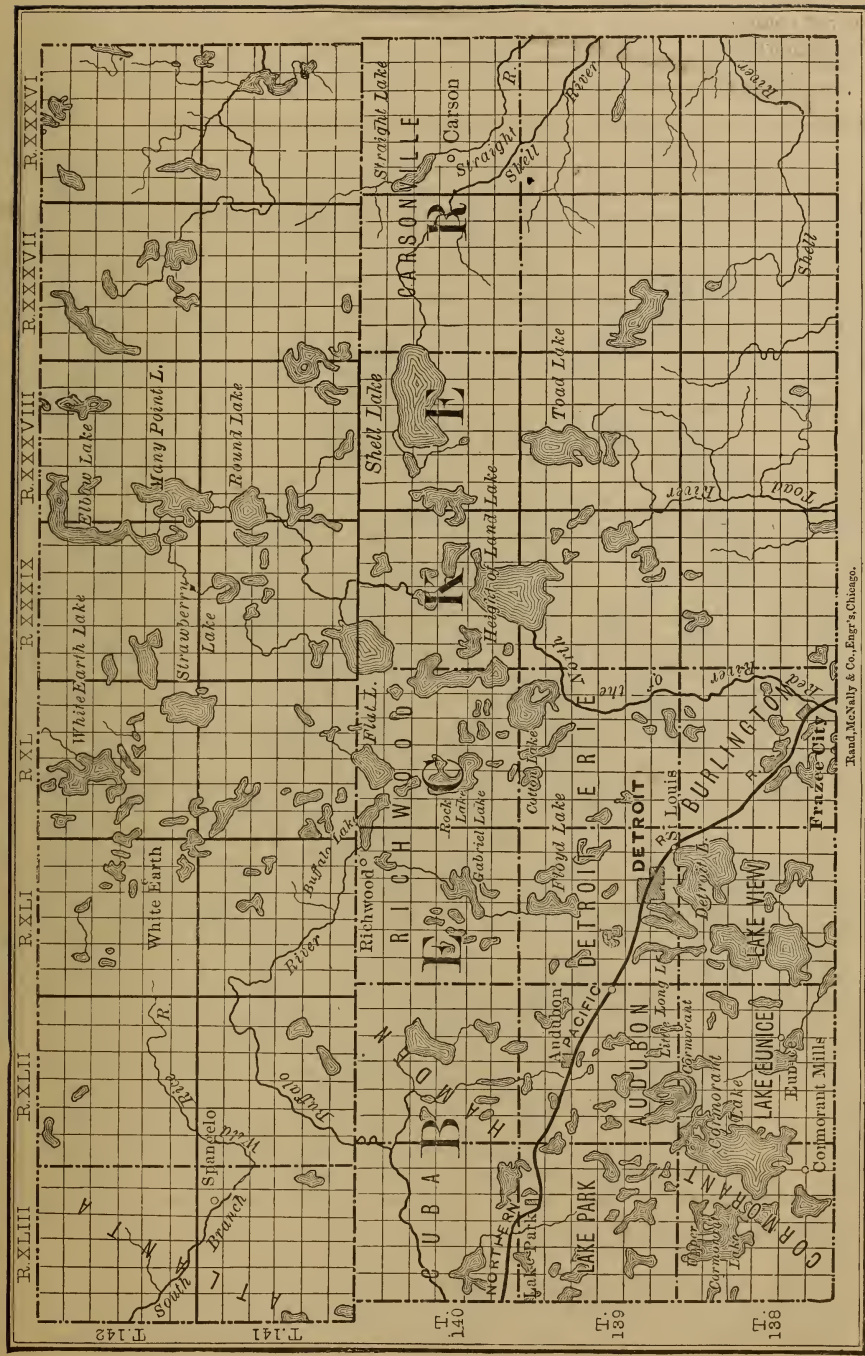
BECKER COUNTY.

Becker county meets the western line of Wadena county. The Northern Pacific crosses the southwest part. The greater part of Becker is properly included within the limits of the Minnesota timber belt. The western-most skirtings of the timber line are still here and there beyond the western limits of the county, and of the county as a whole, it may be said to be half wooded and half prairie. Prairie and woodland in Becker and Ottertail counties are finely intermingled and present many charming landscapes. No other part of Minnesota is so beautifully diversified as this district of country, where the woodlands broadly open and mingle with the prairie in groves and clustering groups of forest trees, the diversity being everywhere rendered complete by expanding sheets of pure water, lakes, and lakelets without number, whose beauties join with grove and glade to constitute this the "Lake-Park Region" of the State. The county has a fine fertile soil and is well watered by the Buffalo and other streams.

Becker county has a land area of 839,605 acres: forest 50 per cent.; prairie 50 per cent. The varieties of timber are similar to those in Todd county. The whole number of farms is 753, a gain of 231 over the previous year. In 1881 there were under cultivation to the principal crops a total of 26,297 acres, an increase from 1880 of 4,776 acres. The whole number of acres in wheat in 1881 was 18,900; in oats were 5,708 acres; in corn, 115 acres, and 787 acres in barley. Averaging the crop for the last two years, the production of wheat has been 16 bushels to the acre; of oats, 33 bushels; of corn, 26 bushels, and of barley, 28 bushels. Of wild hay there were cut in 1881, 5,000 tons. The wool clip was 2,800 pounds. There were manufactured in the county in the last year 185,000 pounds of butter, and 2,000 pounds of cheese. The yield of potatoes was 75 bushels to the acre, aggregating 38,000 bushels. The number of apple trees in bearing in 1881, was 85; growing and not in bearing, 1,997. The whole number of farm animals, same year, was 7,742, including 1,247 horses; 4,480 cattle, of which 1,818 were milch cows; 61 mules; 1,359 sheep, and 595 hogs. There are 16 school houses in Becker county, of which eight are frame, and eight are log. The whole valuation of all taxable property was, as last reported, \$1,060,787. The rate of taxation was $19\frac{4}{10}$ mills. The population of the county is about 6,300. Detroit is the county seat, situated on a beautiful lake of that name.

OTTERTAIL COUNTY.

The general surface characteristics of Ottertail county have been sufficiently stated in remarks on Becker county, bordering which on the south it is located. It is yet more generally interspersed with lakes than is Becker. Ottertail county is one of the best, and in point of settlement and cultivation, one of the most

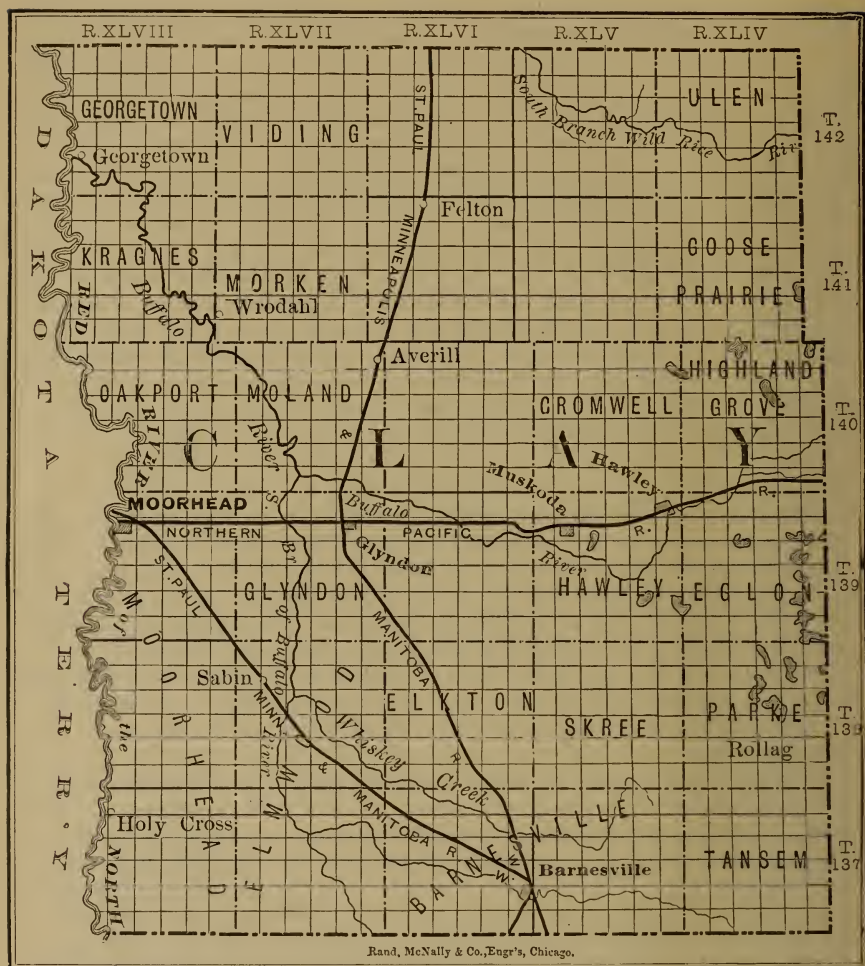


over that of 1880 of 16,311 acres. The whole number of acres in wheat, in 1881, was 78,491; in oats were 19,489 acres; in corn, 2,167 acres, and in barley, 1,745 acres. The average production has been for the past two years, of wheat, 17 bushels to the acre; of oats, 38 bushels to the acre; of corn, 25 bushels to the acre, and of barley, 26 bushels per acre. More than 44,000 tons of wild hay were cut during the past season. The wool clip was nearly 15,000 pounds. There were manufactured 375,000 pounds of butter, and 5,000 pounds of cheese. The yield of potatoes was nearly 90 bushels to the acre. In the county are 1,329 apple trees in bearing, and 14,838 growing, but not in bearing. The whole number of farm animals in 1881 was 31,543, including 6,101 horses; 17,486 cattle, of which 6,900 were milch cows; 205 mules; 4,650 sheep, and 3,101 hogs. There are 114 school houses in the county, of which 60 are frame, and 54 are log. The whole valuation of taxable property, last reported, was \$3,675,386, and the rate of taxation $20\frac{6}{10}$ mills. The population of the county is 22,000. The county seat is Fergus Falls, situated on the Fergus & Black Hills Railroad, which traverses the middle of the county. The Northern Pacific crosses the northeastern portion of the county, and the St. Paul, Minneapolis & Manitoba Railroad crosses the southwestern part.

CLAY COUNTY.

The eastern part of Clay county is rolling prairie, dotted occasionally with small clusters of trees, the extreme outposts of the great Timber Belt's irregular western line. The western half of the county lies in the valley of the Red river, where the soil possesses a greater preponderance of the mineral elements and less proportionally of the products of deep vegetable decomposition. The striking and matured conditions of soil, so finely adapted to wheat and the other small grains, visibly increase all the way from the eastern limits of Wadena county, till at the Red River valley they approach their maximum in a soil composition whose essential characteristics continue, in a greater or less degree, all the way to the western part of Dakota Territory.

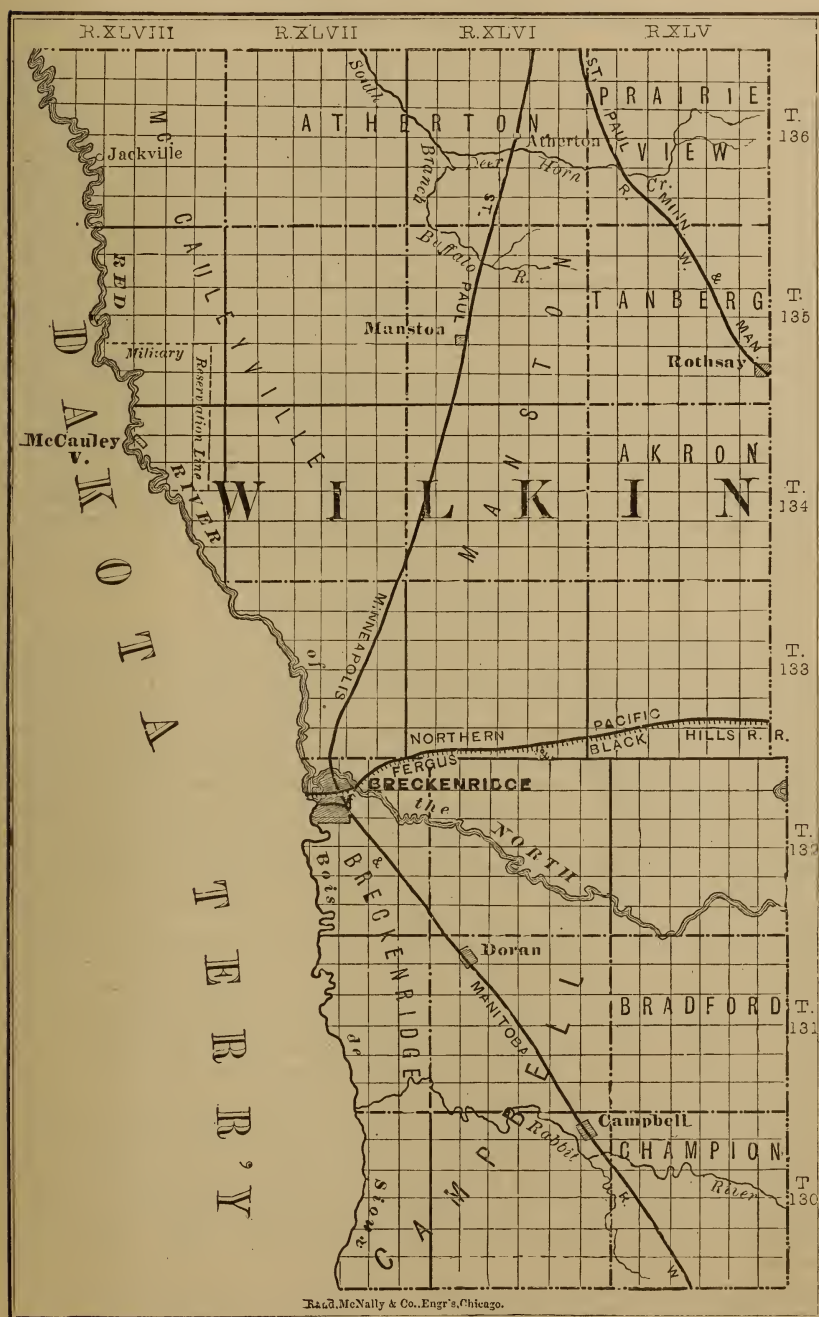
The Red river forms the western boundary of Clay county; the Buffalo crosses it centrally, the Wild Rice river runs through the north and west parts, and the southern portions are watered by a branch of the Buffalo, with ramifying rivulets to the east. Clay county has a land area of 667,093 acres: upland prairie, 40 per cent.; valley, 60 per cent. The whole number of farms is 867, an increase of 35 over previous year. The whole number of acres under cultivation in 1881, was 50,428, an increase of 14,080 acres over that of 1880. The whole number of acres in wheat in 1881, was 37,707; in oats, was 10,205, and in barley, 805 acres. The average production to the acre of these crops, for the past two years, has been of wheat, 17 bushels; of oats, 35 bushels, and of barley, 26 bushels. Of wild hay, 12,000 tons were cut in 1881. The wool clip was 2,900 pounds. The product of butter manufactured exceeded 120,000 pounds; that of cheese was about 1,500 pounds. Potatoes in Clay county yield from 125 to 150 bushels to the acre. The number of apple trees in bearing in 1881 was 71; growing, and not bearing, 1,142. The whole number of farm animals is 8,296, including 2,091 horses; 4,255 cattle, of which 1,937 are milch cows; 311 mules; 999 sheep, and 640 hogs. In Clay county are 19 school houses, 12 frame, one brick and six log. The total valuation of taxable property was, as last officially reported, \$1,754,244, and the rate of taxation was nearly 28 mills. Clay county is traversed midway east and west by the Northern Pacific, and nearly midway north and south by the St. Paul, Minneapolis & Manitoba Railroad. Moorhead, the county seat, is situated on the Red river, immediately oppo-



site Fargo, the county seat of Cass county, in Dakota. Separated topographically by merely the narrow channel of the river, they form, except that one is in Minnesota and the other in Dakota, practically one and the same city. Moorhead exhibits great excellence of improvement in her business blocks, public buildings, hotels and private residences. The population of Clay county at the census of 1880 was 5,900, and is at present not less than 7,000.

WILKIN COUNTY.

In general, the surface and soils of the greater part of Wilkin county, which bounds Clay county on the south and Ottertail on the west, are similar to those of Clay county. The average producing capacity of the entire county for wheat and the small grains, as indicated by late crop statistics, is but slightly less than that of its



neighbors on the north and east. The northern half of the county is not inferior to either.

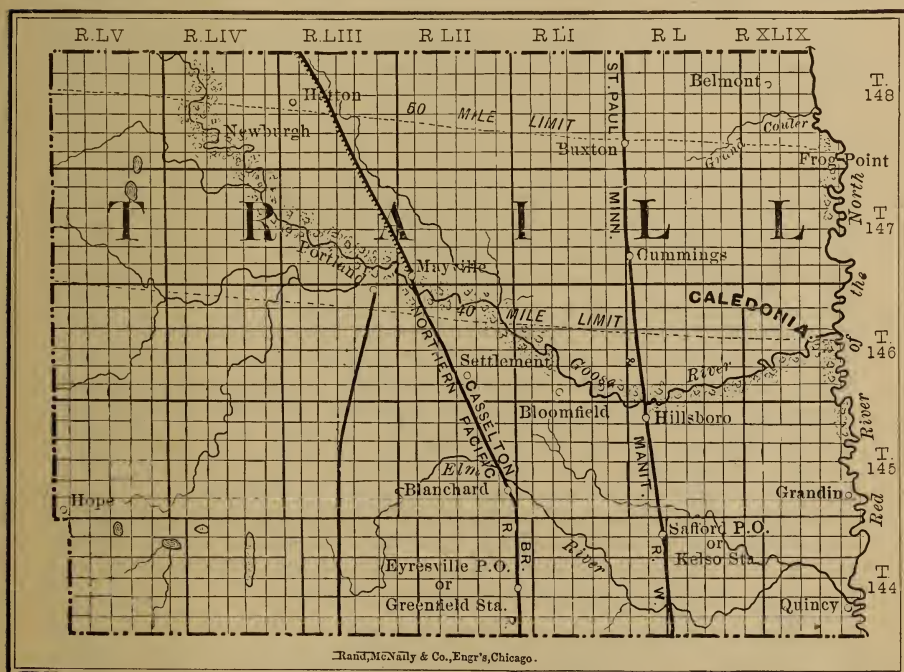
Wilkin has an area of 476,330 acres, of which about one-half is in the valley of the Red river. The other half is upland prairie. The whole number of farms in the county is 263. The whole number of cultivated acres in 1881 was 24,054, a gain of 11,312 over the cultivated acreage of the previous year. The total acreage of wheat in 1881, was 17,838 acres; of oats, 5,188 acres, and of barley, 449 acres. The average production has been for 1880 and 1881, of wheat $14\frac{1}{2}$ bushels to the acre; of oats, 33 bushels to the acre, and of barley, 25 bushels to the acre. The cut of wild hay in 1881 was more than 4,000 tons. The wool clip was nearly 400 pounds. There were manufactured 35,000 pounds of butter, and 250 pounds of cheese. Potatoes yielded from 100 to 125 bushels to the acre. There were in 1881, 312 growing apple trees, but very few are yet in bearing. The whole number of farm animals in 1881, was 2,803, of which 1,151 were horses; cattle, 1,168, of which 522 were milch cows; 123 mules; 125 sheep, and 231 hogs. There are seven school-houses in Wilkin county, six frame and one log. The whole valuation of taxable property last reported was \$803,029. The rate of taxation was $17\frac{1}{2}$ mills. The population of the county is about 2,500. The county seat is Breckenridge. The Fergus Falls & Black Hills Branch of the Northern Pacific crosses the county nearly centrally from east to west, and it is also traversed in a north and south direction by the St. Paul, Minneapolis & Manitoba Railroad.

DAKOTA COUNTIES.

The following maps and accompanying exhibits comprise a triple range of counties from the Red river to the Missouri, including the range of counties traversed by the Northern Pacific, and the parallel ranges of counties lying next north and next south. From the Missouri river to the Montana boundary a double range of counties is given. The average production is made up from the crops of the last two years, giving, where thus stated, not the average for either year, separately, but the average for the period of two years. In this connection, to avoid the necessity of future reference to the fact in the exhibits of each county, it must be stated that the average production per acre for 1881 was very considerably less in all the Dakota counties than was ever before known. The joint average for the last two years will therefore be less than for any other equal or longer period in the records of Dakota farming. The season of 1881 was exceptionally unfortunate for the crops from the Red river westward. In the Red River valley the seeding season was uncommonly late, by reason of the condition of the lands from the protracted spring rains, and the sprouting grain in many large fields was greatly injured. In all the upland counties as far west as the Missouri river, the grain was seriously injured by the very unusual occurrence, in that climate, of continued hot, sirocco-like winds at the critical period of the maturing grain. There were other causes which, in localities, conspired to reduce the average production. These facts prove that even the climate of Central and Eastern Dakota in the north half of the Territory, is not absolutely exempt from caprices of weather unfavorable to the crops. It can be truly affirmed, however, that they are of rare occurrence, and far less liable to occur than elsewhere further south. The marked advance in the market price of wheat, fortunately, about covered the loss in average production, and the profits of Dakota farming were most generally but little less in 1881 than in previous years.

TRAILL COUNTY.

Trail county bounds Cass county (through which runs the main line of the Northern Pacific) on the north, and lies about midway between the 47th and 48th parallels of latitude. More than three-fourths of the entire surface of the county is in the Red River valley. The county is well watered. The Elm river crosses the southern portions and joins the Red river near the southern boundary of the county. In the middle and northwestern parts the Goose river, with its several tributary streams, crosses the entire county variously. The northeastern townships are traversed by another tributary of the Red river. There is a considerable



belt of good timber on the Goose river, heavier than is common on the streams running into the Red river. The Red river, also, is well bordered in Traill county by a good growth of timber. The chief varieties of timber in the county are oak, basswood, ash and elm. The surface soil of Traill county is rather deeper than in many other localities in the Red River valley, and will average about 24 inches for the entire portions situated in the valley; the surface soil of the uplands varying from 15 to 24 inches in depth. It is also in localities blacker, where it carries more decomposed vegetation than the average of soil in the valley. Like all the soils of the valley it is a calcareous loam, heavily charged with the lime carbonates and phosphates, mixed with clay and silicious sand, modified by the decomposed vegetation of ages. When dry it is friable like ashes, and when wet is slippery and adhesive.

The whole number of acres of land surface in Traill county is, by actual sur-

vey, 774,538; of this, about 75 per cent. is valley and 25 per cent. uplands. The whole number of acres under cultivation in 1881 was, as carefully estimated, 45,000. The whole number of acres in wheat was 35,000. The remainder of the crop was most largely oats. The yield per acre for the two years last past was, of wheat, 19 bushels, and of oats, 45 bushels. The yield of barley, potatoes and all garden and root crops was proportionally large. Traill is a new county, but is rapidly developing into an aggregation of prosperous farming communities. The finest and best bred stock in the Territory is on the Grandin farm, in this county, near Mayville. The most excellent locations for farms in the county, where all the lands are choice, are, doubtless, the districts of the Goose river. The population of Traill, as given by the census of 1880, was 4,123. It is now not less than 6,500. The county is crossed north and south by the Casselton branch of the Northern Pacific, and by the Barnesville extension of the St. Paul, Minneapolis & Manitoba Railroad. Caledonia is the county seat.

CASS COUNTY.

Cass county, bordering Traill on the south, is immediately opposite Clay county, Minnesota, and is crossed centrally by the main line of the Northern Pacific. Nearly two-thirds of the county lies in the Red River valley, and the remainder is gently undulating upland prairie, having in the western tier of townships the narrow depressions on the Maple river. Cass county is excellently watered, having the Red river for its eastern boundary, and being traversed by the Sheyenne, Maple, Rush, Wild Rice, and other tributaries of the Red river. Along the Red, Sheyenne and Maple rivers are good growths of timber, of which the varieties are oak, ash, elm, soft maple, hackberry, box elder and cottonwood. The surface soil of Cass county has an average of 20 inches in depth, and possesses the same distinguishing qualities of component mineral salts which belong to all that region. The subsoil is from three to four feet in depth, is itself a porous, clay marl, quite spongy, resting on a compact, bluish clay.

The actual land surface of Cass county is 1,124,943 acres, of which about 65 per cent. is valley and 35 per cent. uplands. The whole number of acres in cultivation in 1881 is carefully estimated to have been 180,000. The following is a closely approximate statement of cultivated area in detail.

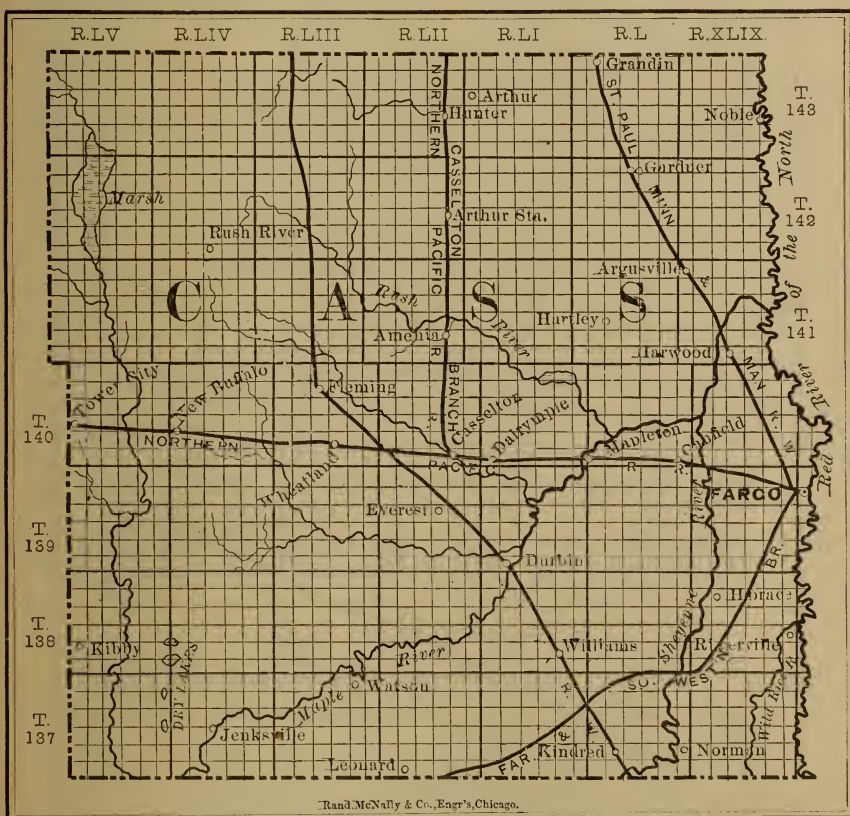
		ACRES.									
Township	137, Ranges	49, 50, 51, 52, 53, 54, 55.....	13,690								
"	138, "	49, 50, 51, 52, 53, 54, 55.....	24,000								
"	139, "	49, 50, 51, 52, 53, 54, 55.....	48,000								
"	140, "	49, 50, 51, 52, 53, 54, 55.....	48,000								
"	141, "	49, 50, 51, 52, 53, 54, 55.....	19,200								
"	142, "	49, 50, 51, 52, 53, 54, 55.....	11,400								
"	143, "	49, 50, 51, 52, 53, 54, 55.....	11,150								
"	140, "	48* (fractional).....	2,000								

Total acreage.....177,440

The above statement of cultivated area in each range of townships is low, and the actual cultivated area was probably not less, in round numbers, than 180,000 acres. The whole number of acres in wheat was about 155,000; in oats, 20,000 acres; and in barley, flax, potatoes and other crops, 5,000 acres. The average production for the last two crop seasons of 1880 and 1881 was, of wheat, 17 bushels to the acre, and of oats, 40 bushels to the acre. In 1881, Cass county was

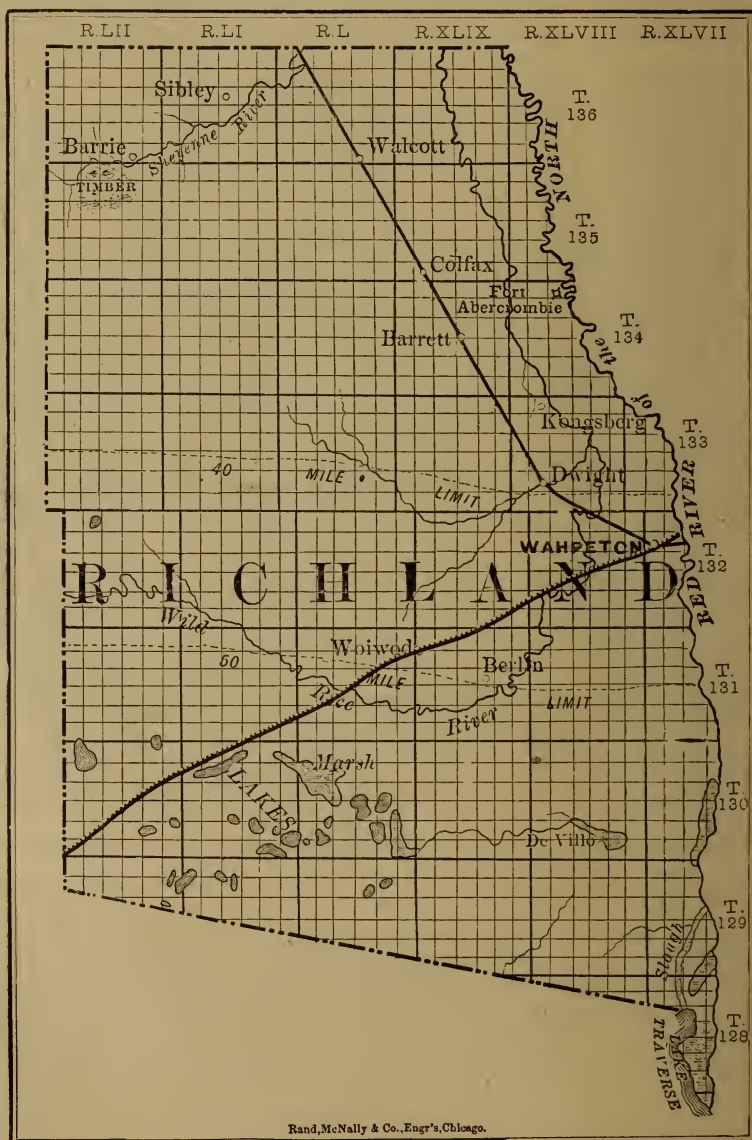
* Other fractions of Range 48 are included in Range 49.

in but the eighth year of its farming settlement, and, as shown in the foregoing statistics, ranks foremost among the best counties in the wheat-producing districts anywhere east of the Rocky mountains. Upon the facts of both quality and quantity of wheat production, there is no doubt of its complete superiority. The aggregate value of the wheat crop (producers' prices) in 1881, notwithstanding it was the most unfavorable crop season ever known in the county, was not less than \$2,500,000. But Cass county can not claim to be the most fertile and best available for agriculture in Dakota. She is a fair average of the valley counties, which



are not better adapted or more enduring for wheat production than the upland countries for a far distance west. According to the census of 1880, Cass county had then a population of 8,998. It is now not less than 14,000. It is well supplied with lines of rail transportation. The Northern Pacific main line crosses it centrally. The Casselton Branch is built north from Casselton through the county, and the Fargo & Southwestern Branch of the Northern Pacific traverses the southern portions. The St. Paul, Minneapolis & Manitoba runs north and south through the county. Fargo, the county seat, is the rapidly growing chief city of the Red River valley, and is already much the most populous town in Dakota. Its population 1880 was 2,693, but now, in February, 1882, it contains about 5,000

resident people. Fargo is one of the most rapidly and solidly growing young cities in the entire West. It is the commercial centre of a wide area of great wealth of production. Its large elevators, mills, warehouses, public buildings and institutions, and private residences, well attest the solid and prosperous character of its business interests. The entire business of the city is animated by a spirit of great progress and enterprise. For so young a city it has already accumulated a surprising amount of wealth.



RICHLAND COUNTY.

Richland adjoins Cass county on the south. The irregular bluff line which confines the Red River valley on the west, having, where it meets it, a general elevation above the valley of from 12 to 15 feet, more nearly approaches the Red river in Richland county than in Cass. The southern limits of the valley also originate in Richland. The county is bounded on the east by the Red and the Bois de Sioux rivers. The Sheyenne crosses the northwestern townships. The Wild Rice river takes its rise in and traverses nearly the entire length of the county, north and south. In the southwestern townships, are upwards of 20 small lakelets and many smaller ponds, lying mostly in Ranges 49, 50, 51 and 52, Township 130. The soil of Richland is generally of similar character to that of Cass county. The whole number of acres of land surface in Richland county is, by actual surveys, 901,511, of which about 40 per cent. is included in the Red River valley, and the remainder is upland prairie. The whole number of acres under cultivation in 1881 was 55,000. Of the cultivated area, there were, in 1881, about 37,000 acres in wheat, and the remainder was in oats, barley, flax and the root crops. The average production, for a period including the years of 1880 and 1881, was of wheat, 17 bushels to the acre, and of oats, 35 bushels to the acre.

The Land Grant of the Northern Pacific, lying in Traill, Cass and Richland counties, is practically all disposed of; some railroad lands in the southwest part of Richland are yet unsold. In Cass county, the Government lands are now nearly all sold. To a slight extent in the upland districts of Cass, and more largely in Traill and Richland counties, there are still opportunities for desirable entries of land under the Homestead and Pre-emption privileges. In all three counties, are abundant opportunities for the purchase of unimproved lands from private parties, both resident and non-resident owners. The prices of such lands range all the way from \$7 to \$20, according to desirability, nearness to market, etc. The terms of payment, as to time, are liberal.

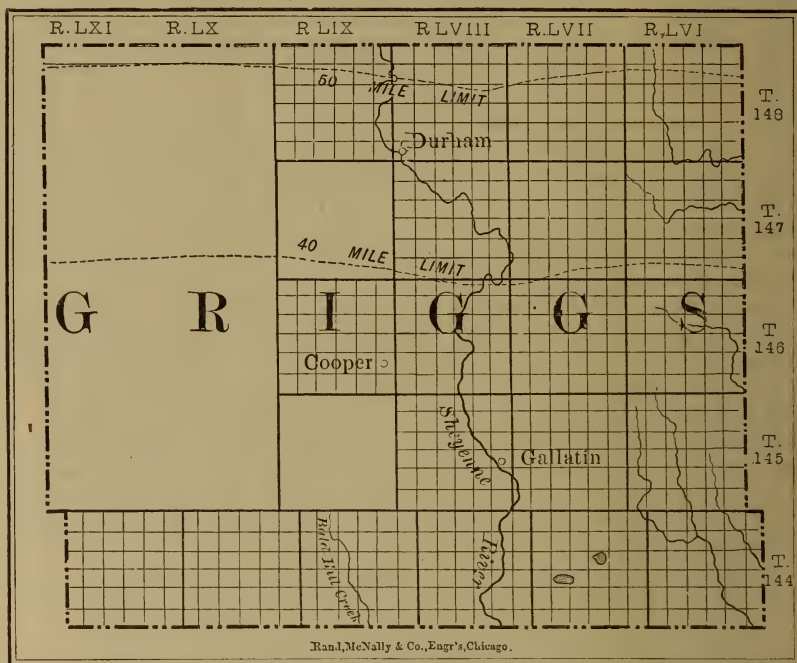
The population of Richland county in 1880 was 3,597. It is now not far from 4,500. Wahpeton is the county seat.

GRIGGS COUNTY.

The next tier of counties, within the range of these exhibits, west of Traill, Cass and Richland, is that of Griggs, Barnes and Ransom counties. Griggs county bounds Traill on the west. Its surface, except in the narrow limits of the Sheyenne valley, is undulating upland prairie. Not more than two per cent. of its surface is bottom land. The agricultural value of the land in general in Griggs county is unquestionably excellent. Its middle portions are crossed by the Sheyenne river, which runs north and south through the entire county. The Goose river rises in the northeast part and traverses several townships. Lakes Jessie and Johnson are in the west part of the county. The width of the Sheyenne bottom varies from a half mile to nearly a mile in width. The Sheyenne is well fringed with timber. The varieties are oak, box-elder, elm, hackberry and basswood. The average depth of surface soil in Griggs county is 20 inches. The subsoil of varying, but always of considerable depth, is a conglomerate without stratified order, an irregular admixture of many components, and carrying heavily the alkaline salts, lime and silicious sand. It is a strongly reinforcing and retentive subsoil, resting commonly on a substratum of bluish clay.

Like the soils of the Red River valley, both the soils and subsoils of Griggs county abound in the best elements for the production of wheat.

The total area of land surface of Griggs county is as follows : Townships 144 to 148 inclusive, of Ranges 56 and 57, and Township 144, of Ranges 58, 59, 60 and 61, surveyed complete, 318,000 acres; six townships surveyed, but not platted, estimated, 138,240 acres; balance not surveyed, estimated, 230,400 acres; total, 686,640 acres. The county is entirely new; the railroad lands are mostly disposed of, and

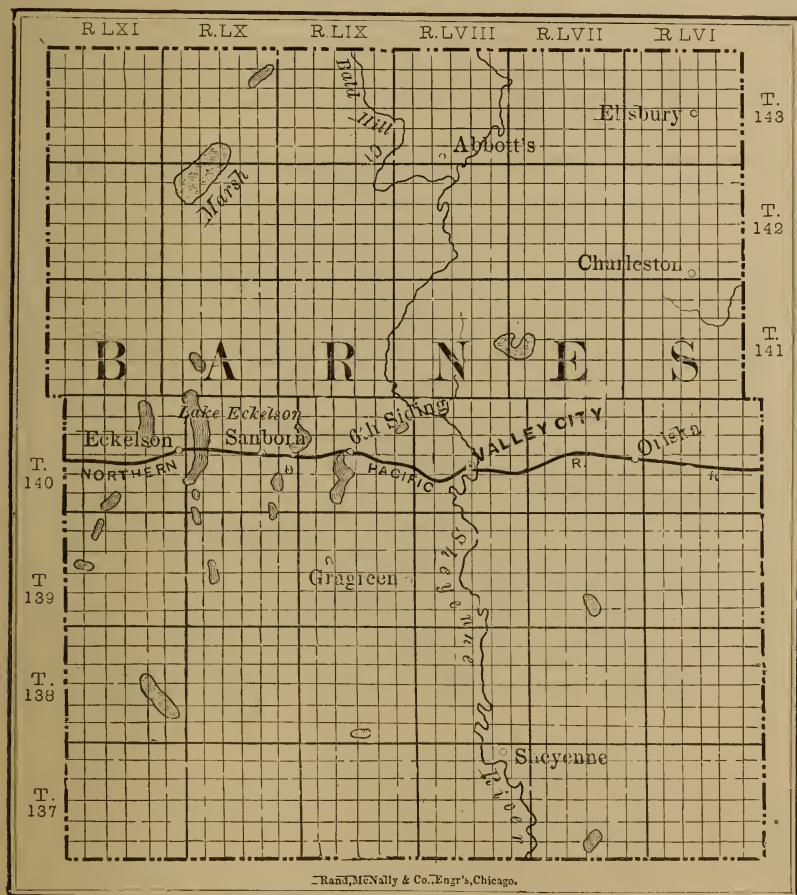


owned by non-residents, but Government lands are all open to settlement. There will be a large immigration to Griggs the coming season. In 1881, 8,000 acres were under cultivation; but comparatively little wheat was sown, it being, practically, the first crop after breaking; the yield of wheat per acre was large; 40,000 bushels of oats were grown on about 800 acres, at Durham, in the north part of the county. The present population of the county is about 25 families. The surveys of the county, it is hoped, will be completed during 1882.

BARNES COUNTY.

Barnes county, adjoining Griggs on the south, is traversed centrally by the main line of the Northern Pacific. Its surface is undulating uplands, more than 97 per cent.; bottom lands less than three per cent. The Sheyenne river traverses the entire middle portions of the county, north and south. The Maple river rises in and crosses the northeastern townships. The bottom lands on the Sheyenne average three-quarters of a mile in width in the county. There are several small lakes in the middle-western and western townships adjacent to the Northern Pacific Railroad. The varieties of timber which belt the Sheyenne are oak, box-elder, elm,

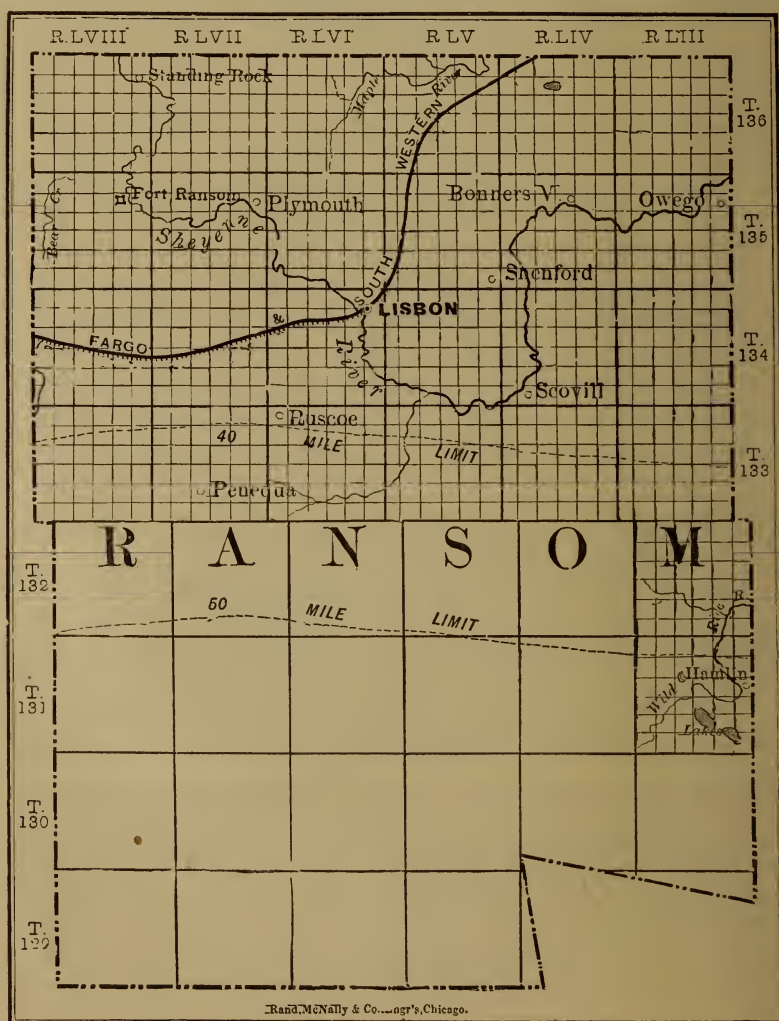
ash, hackberry and basswood. A small per cent. of the entire surface of the county is natural meadow, yielding from $1\frac{1}{2}$ to 2 tons per acre. The native grasses of the prairie, except where these meadows occur, do not produce hay. The small fruits, strawberries, raspberries and gooseberries grow wild in Barnes county as they do generally in the upland counties of Northern Dakota. The average depth of the surface soil in Barnes is 17 inches, and it is very productive. The subsoils



are a conglomerate, united by yellow clay, quite commonly extending to depths of ten feet, or more, and superimposed on blue clay. Both surface and subsoils are strongly impregnated with mineral salts, and lime in various forms. Good well water is found at an average depth of 30 feet. Agricultural settlement in Barnes did not fairly commence until 1877, when about 1,000 acres were under plow.

The whole number of acres of land in Barnes county, all surveyed, is 959,167. The total area of cultivated lands in 1881 was more than 45,000 acres, of which 85 per cent. was in wheat, and the remainder in oats, barley, flax, etc. Seven acres

of sod corn (yellow flint) a few miles from Valley City, produced 450 bushels. The joint average production for the last two years has been of wheat, 18 bushels to the acre, and of oats, 35 bushels to the acre. Nearly all the wheat grown in Barnes county grades as No. 1 Hard. The average price of wheat delivered at the elevator, in 1881, was \$1.15 per bushel. The population of Barnes county, census of 1880, was 1,585. It is now more than 3,000. Valley City is the county seat, a thriving town situated on the Sheyenne river, fast opening into importance. It has a fine court house, and central school building, several substantial brick business blocks, and an excellent new hotel building. Other towns and villages in the county are having rapid progress. The Valley City & Turtle Mountain Railroad is projected from the south line of the county north, through Valley City to Turtle Mountain, a distance of 150 miles.



RANSOM COUNTY.

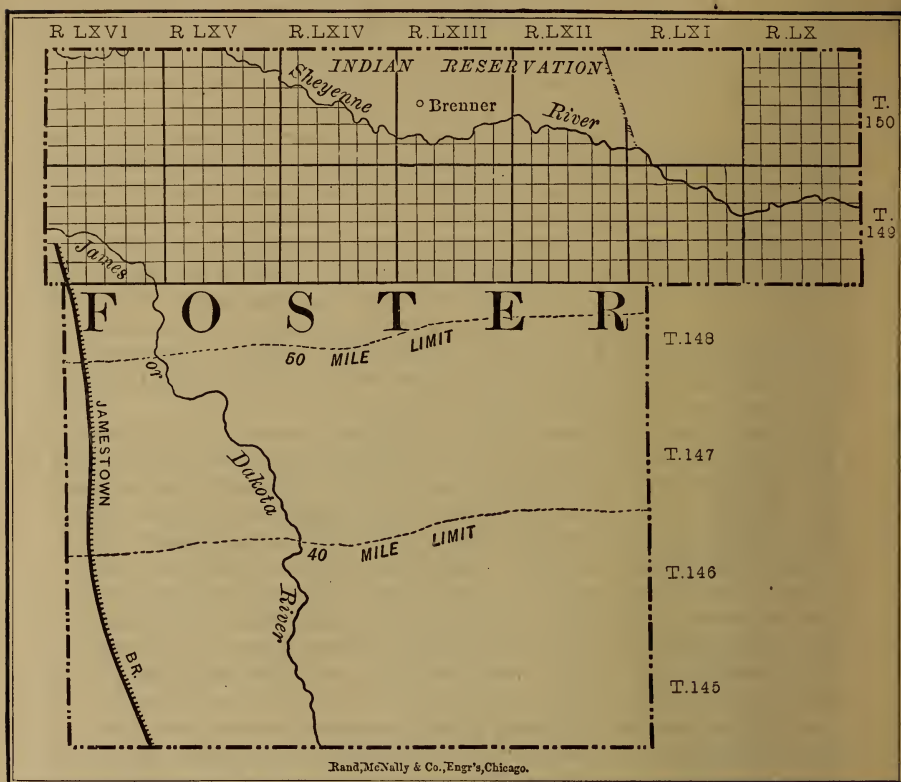
Ransom county adjoins Barnes and Cass counties on the south. Its surface is undulating: prairie, 96 per cent.; bottom lands, 4 per cent. It is traversed by the Sheyenne river from its mid-western townships on the north, generally in a south-east direction to the middle portions of the county, where the river reverts to the north and irregularly crosses the northeastern townships. The valley of the Sheyenne considerably widens in Ransom county, and has a general breadth of nearly two miles. The Sheyenne timber belt, more dense and heavy in Ransom, has the same varieties of wood as in Barnes county, chiefly oak, ash and elm. The soils and subsoils in Ransom county are generally similar in producing qualities to those of Barnes, but the surface soil is quite often lighter and more sandy. Good well water is found at average depths of 25 and 35 feet, though sometimes wells have to be driven 75 feet deep before water is obtained. Previous to 1880 there was practically no agricultural production, and little or no land broken except by a few old settlers or squatters on the banks of the Sheyenne.

The land surface of Ransom county is as follows: Townships, 131 to 136 inclusive, of Range 53, and Townships 133 to 136 inclusive, of Ranges 54, 55, 56, 57 and 58, comprising 597,356 acres; balance, not surveyed, estimated at 467,000 acres; total, 1,064,356 acres. Of about 20,000 acres broken and partly cropped in 1881, 8,000 acres were in wheat, and 2,000 acres in oats. The number of acres broken on two farms alone in 1881 was 6,000. Ransom county seems to have been measurably exempt from the conditions of weather in 1881, which reduced the production in Barnes, Stutsman and other counties north. The average yield per acre of wheat was 20 bushels, and of oats, 45 bushels. The population of the county under the census of 1880 was 537. Immigration was very active in the fall of 1880, and during the past year, and the population to-day is not less than 1,500.

In the tier of counties comprising Griggs, Barnes and Ransom, particularly in Griggs and Ransom, are abundant opportunities to secure the choicest lands under the land laws of the United States. The railroad lands are for the greater part disposed of. Large tracts of unimproved land in each of these counties are held for sale by private owners and on liberal terms to purchasers, both as to prices and time. The Fargo & Southwestern Branch of the Northern Pacific is now under construction across Ransom county.

FOSTER COUNTY.

The next tier of counties west is that including Foster, Stutsman and La Moure. Of these Foster is the northern county, and bounds Griggs on the west. The northern sections of Foster are traversed by the Sheyenne river, which here pursues an east and west course across the entire county. The western and middle portions to the south line of the county are crossed by the devious route of the James or Dakota river. The valleys of both rivers are in this county narrow, being less than a half mile in width, and the growth of timber is less and of lighter weight than in the lower counties. The surface of the county is undulating, and practically all prairie. The soils of this county are substantially the same as in Griggs, from the value and desirability of which for farms there is little deviation in character of lands, except that in a small section where Griggs and Foster meet, there are tracts of surface more or less depressed and sandy. The great general value of the lands in Foster county for wheat, oats, etc., is plainly indicated by the character of their native vegetation, and the formation of their soils and sub-

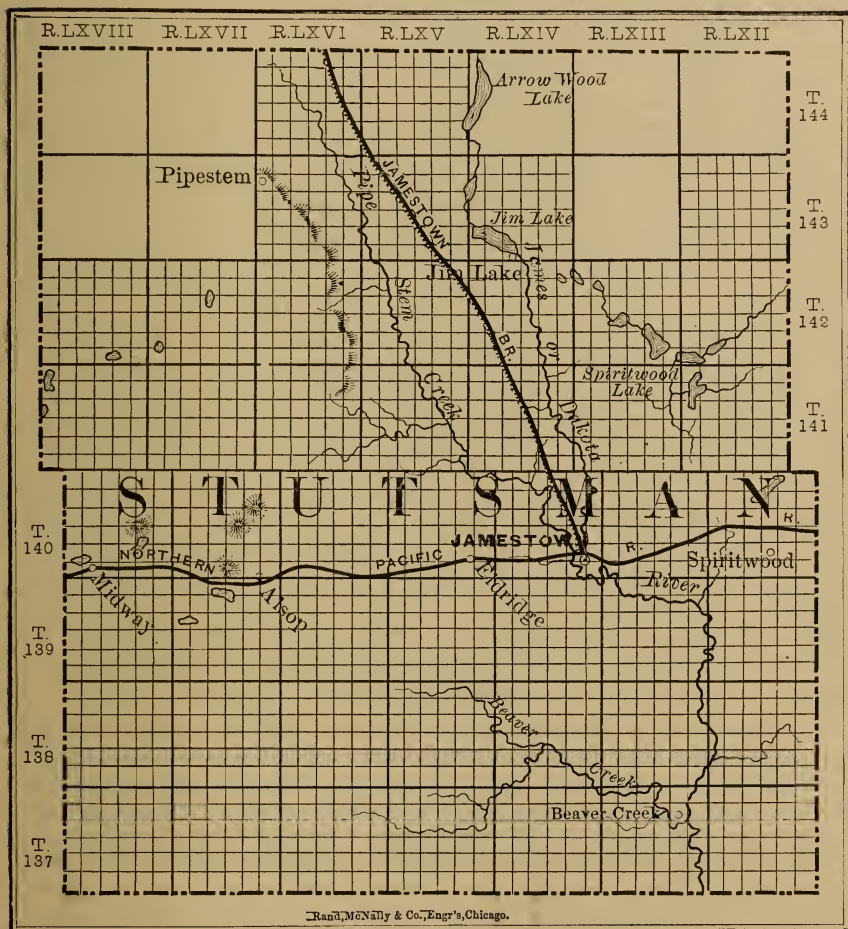


soils. The branch from Jamestown of the Northern Pacific, now under construction, will cross this county on the west, and will lead to its rapid settlement and growth. On the north, in Ramsey county, is Minne-Waukan, or Devil's Lake, 40 miles in length and 20 miles in its greater width, situated in a region of country which has attracted much attention, towards which several branch lines of railway are projected. The area of Foster is as follows: subdivided, 259,400 acres; not subdivided, 484,600 acres; Indian and military reserve, 40,000 acres; total, 758,000 acres. There are at present no agricultural settlements worthy of note in Foster county.

STUTSMAN COUNTY.

Stutsman county bounds Foster county on the south, and Barnes county on the west. It is traversed through the south part of its middle range of townships by the main line of the Northern Pacific. Its surface is undulating: prairie, 96 per cent.; bottom lands, 4 per cent. The southwestern townships are broken by the low chain of the Coteaus. The middle portions of the county are traversed by the winding James river from north to south. The Pipestone river rises in the northwest part, and, crossing seven townships, meets the James river near the crossing of the Northern Pacific. Beaver creek and other smaller feeders of the James are in the southern and southeastern townships. The valley of the James

river varies from three-quarters to two and a half miles in width. The varieties of timber on the wooded belt of the James, are the elm, box-elder, oak and hackberry. Here, as in Barnes county, are fine natural meadows, from which are cut from one and a half to two tons of wild hay. Strawberries, raspberries and gooseberries grow wild on the prairie. There appears to be no doubt of the successful



culture of the small fruits. The feasibility of the orchard fruits in the county is now undergoing trial. Excellent well water, superior to that of the Sheyenne and Red river countries, is found at an average depth, in both uplands and valleys, of 30 feet. In both localities the wells vary in depth from 12 to 50 feet. The depth of surface soil over the county is, on uplands, from 16 to 24 inches; in the James River valley, from 12 to 40 inches. The subsoil, varying in depth from 10 to 20 feet, where it rests on blue clay, is variously composed, a conglomerate united in a body of yellow clay. Both soil and subsoil carry a large admixture of the mineral

salts, lime in various forms, and silex, which distinguish the lands of the great northern wheat belt.

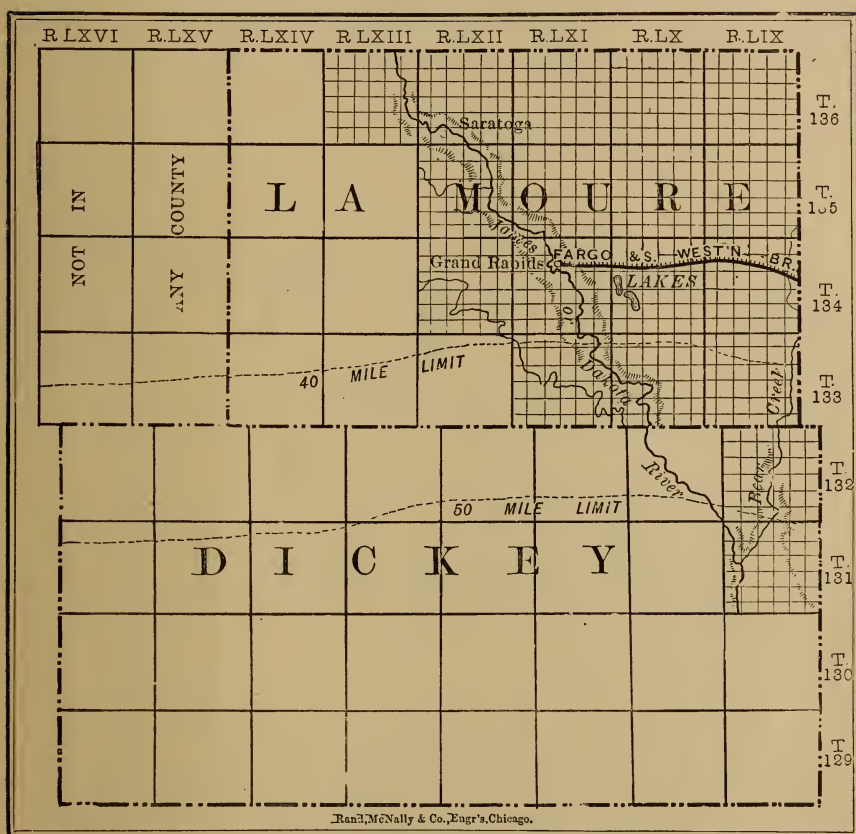
The whole number of acres of land surface in Stutsman county is as follows: Townships 137 to 142 inclusive, of Ranges 62, 63, 64, 65, 66, 67 and 68, all surveyed, 829,371 acres; six townships surveyed, but not platted, 138,240 acres; balance not surveyed, estimated, 204,320 acres; total 1,171,931 acres. The total cultivated acreage to the cereals in 1881, was in round numbers 20,000 acres; of which 11,000 acres were in wheat, 5,000 in oats, 2,000 in barley, and 2,000 in flax. The joint average production per acre for the last two years, 1880 and 1881, was of wheat, 18½ bushels; of oats, 35 bushels, and of barley, 30 bushels.

Stutsman county may be singled out as a fair example of the reduced average production per acre which occurred in a greater or less degree in the season of 1881, in most of the counties of Northern Dakota, and which should be definitely stated as explaining the fact of lower average production, shown in these exhibits, during the past two years, than was the fact for any equal period in previous years of farming in Dakota. The yield of wheat in Stutsman county in 1880, was 25 bushels to the acre; of oats, 50 bushels to the acre, and of barley, 40 bushels to the acre. And generally the average production was considerably larger in the upland counties than in the Red River valley. The causes of the decline in production in 1881 were, as stated at the outset of these exhibits of Dakota counties, an uncommonly wet seeding season, and, chiefly, the prevalence, when the grain was ripening, of injurious hot winds, a caprice of climate not before known in the northern wheat belt. The fair statement of the common average production in the belt of Dakota counties along the Northern Pacific, would be from 20 to 22 bushels of wheat to the acre, and 45 bushels of oats to the acre. The average prices at which the crop of 1881 in Stutsman county was sold at the local elevators were, wheat, \$1.12½ per bushel; oats, 55 cents per bushel. The population of Stutsman, as given by the census of 1880, was 1,007; it is now about 2,000. Jamestown, handsomely located on the James river, is the county seat, and one of the most promising towns in North Dakota. The branch of the Northern Pacific to the Mouse river country, now being built, meets the main line at Jamestown.

LA MOURE COUNTY.

La Moure county joins Stutsman on the south. The general surface of the county is undulating: upland prairie, 94 per cent.; bottom lands, 6 per cent. Ranges 65 and 66 are broken by the Coteau formations. The valley of the James, in La Moure county, widens to from two to four miles in breadth, and extends through the county north and south. The varieties of timber are the same as on the James river generally. There are numerous springs along the river banks near the bluff line, seldom found elsewhere in North Dakota. Excellent well water is obtained at about the same average depth common to this country. The surface and sub-soils are precisely similar to those of Stutsman county. At Grand Rapids is a fine water power. The James river, it is believed, is navigable from Grand Rapids to Columbia, Brown county, a distance of 100 miles.

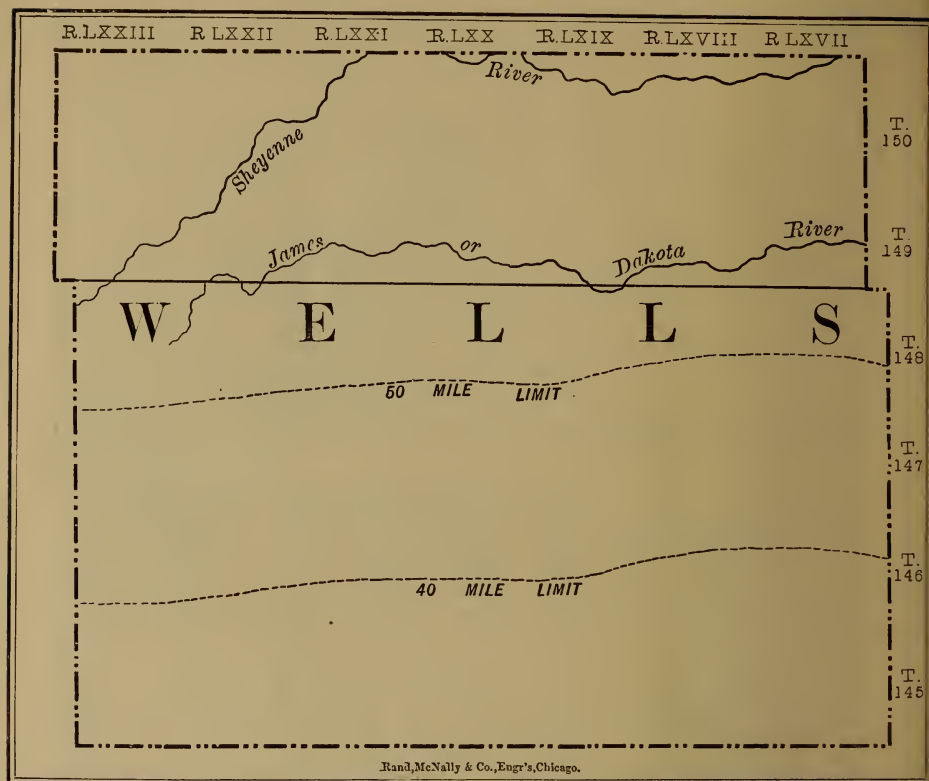
The land surface of La Moure county is as follows: Townships 133 to 136 inclusive, of Ranges 59, 60 and 61; and Townships 134 to 136 inclusive, of Range 62; and Township 136, Range 63, all surveyed, 368,294 acres; balance, estimated, 184,320 acres; total of county proper, 552,614 acres; add Townships 133 to 136 inclusive, of ranges 65 and 66, estimated, 184,320 acres; total 736,934 acres. The first crop in La Moure was grown in 1881, and was as follows: wheat, 208 acres; oats, 467 acres;



flax, 117 acres; ready for crop in 1882, 2,921 acres. The population in 1880, U. S. census, was 20. It is now 250. Of this tier of counties, Foster, Stutsman and La Moure, the first and last named are entirely open to settlers under the Homestead and Pre-emption laws. Stutsman is largely so. The railroad lands in the west portions of each of the three counties are largely unsold. No tier of counties on the line of the road offers better present inducements to immigration than these three.

WELLS COUNTY.

The succeeding group of counties on the west, partly or wholly included in the Land Grant of the Northern Pacific, are Wells, Kidder and Logan. Wells is on the north and bounds Foster county on the west. Its surface is undulating: upland prairie, 98 per cent.; bottom lands and river slopes, 2 per cent. The south-western part of the county is broken by the Coteaus. The northern range of townships is traversed by the Sheyenne and several branches across the entire county east and west. The valley of the Sheyenne is nearly a half mile in width. The James river takes its rise in the middle western portions, and crosses the county parallel to the Sheyenne. The timber on the rivers is comparatively light,

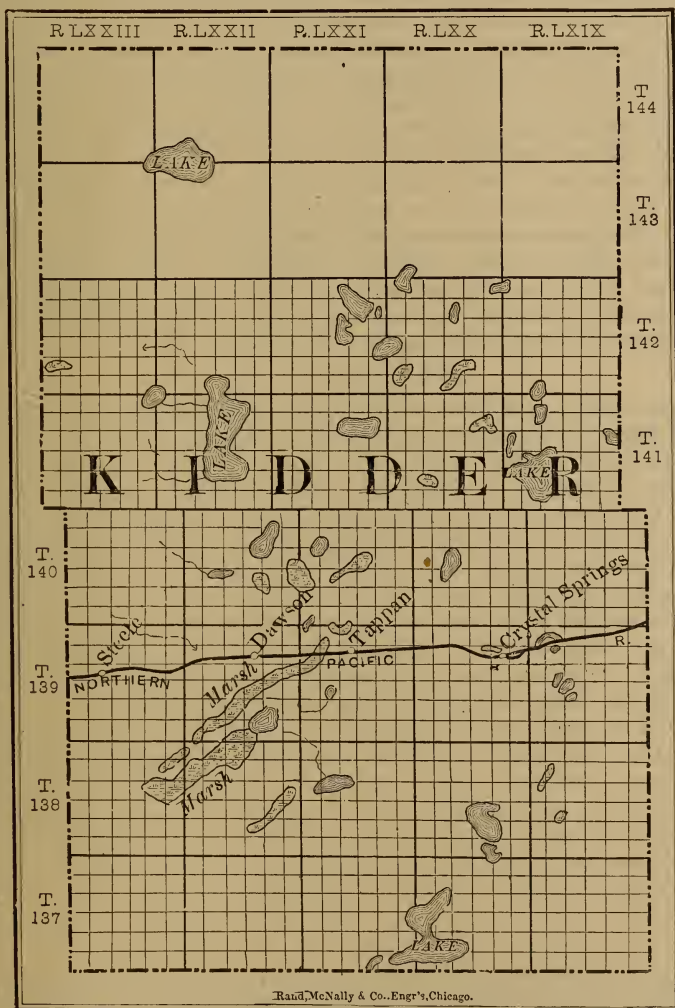


though some fine groves are on the Sheyenne. The surface soils of Wells county are uniform with those of Stutsman and Foster counties, and the subsoils are similarly formed. Wells county is an excellent county of land, and is destined to prove greatly productive. In the writer's judgment, it is not inferior as farming land to any of the counties previously named. The land area of Wells county (no surveys having been made) is estimated to be 967,680 acres. There are no agricultural settlements worthy of note.

KIDDER COUNTY.

Kidder county adjoins Wells on the south. The Northern Pacific crosses the lower middle range of townships. For the greater part of its surface, Kidder county is broken by the formations of the Coteaus. Here is the dividing ridge which separates the great Missouri slope from Eastern Dakota. Townships 138, 139 and 140, of Ranges 72 and 73; and Townships 139, and parts of 138 and 140, Range 71; and about one Township in Range 70, are elevated table lands, slightly undulating or nearly level. These townships—a broad bay of the Missouri plateau interpenetrating the Coteaus—comprise the only widely extended, compact area of practicable wheat lands in the county. The remainder of the county is occupied by the Coteaus, within which, however, are opportunities for small detached farms. Of the elevated table lands thus defined, the surface alluvium is a similar rich,

black, calcareous loam to that found in the counties east of the Coteaus. The agency of water in stratifying the Drift deposits is apparent throughout the Missouri plateau, and the various components are less confusedly intermingled than is common in the uplands east. The subsoil of the Kidder county table lands is composed



of silicious sand and disintegrating limestone gravel. This stratum is five feet deep, and fully 30 per cent. is lime. It is superimposed on a hard pan or concrete of clay, sand, lime and gravel. Below the latter stratum is a bed of gravel in which water is found, very excellent in quality, and flowing strongly and abundantly. Well water is obtained over the county at an average depth of 25 feet. There are also natural springs on the wheat lands in Kidder county. No rivers traverse this

county, but the Coteaus are numerous interspersed with lakes, so thickly occurring that, in nearly all its parts, Kidder is finely watered for stock ranging.

The entire land surface of the county is as follows: Townships 137 to 142 inclusive, Ranges 69, 70, 71, 72 and 73, all surveyed, 663,418 acres; balance, estimated, 226,000 acres; total, 889,418 acres. Farming operations have, so far, been confined to the vicinities of Tappan, Steele and Dawson; at the two first-named points are located respectively the Troy and Steele farms. The total acreage under cultivation in 1881 was, in wheat, 2,300 acres; in oats, 500 acres; in barley, 200 acres; and in flax, 100 acres; total, 3,100 acres. In 1880 the acreage was, wheat, 1,600 acres; oats, 350 acres, and barley, 10 acres; total, 1,960 acres. The average production in 1880 was, of wheat, 25 bushels to the acre; oats, 50 bushels, and barley, 40 bushels to the acre. The average production in 1881 was considerably less, owing to the causes referred to as injuriously operating in Stutsman and other counties. The joint average production for 1880 and 1881 was, of wheat, 17½ bushels to the acre; oats, 33 bushels, and barley, 28 bushels. There are ready for the crop of 1882, 4,000 acres. The population of Kidder county, as per census reports of 1880, was 89. That figure, however, was in excess of the actual resident population. This, in the fall of 1881, was 75. It is now 150.

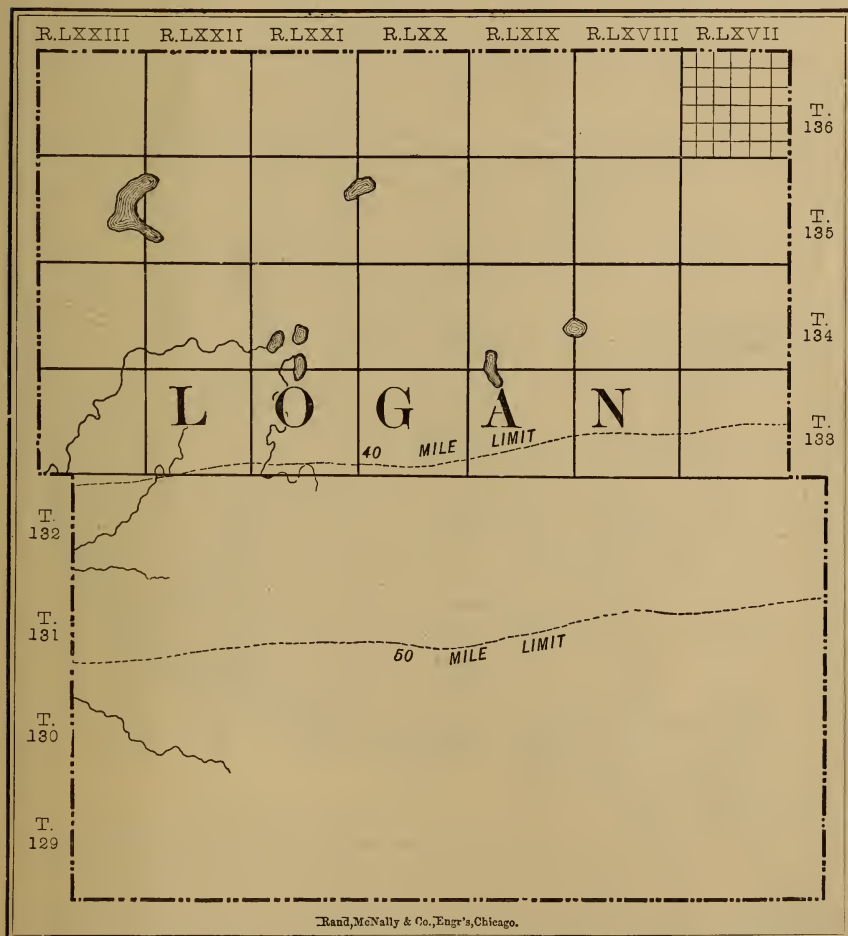
THE COTEAUS.

The low chain of hills which, crossing the British boundary at the northwest corner of Dakota, ranges in a generally southeast direction till it is lost on the elevated prairies of Central Dakota, and divides the water courses of the central and eastern portions of the Territory, is called the Coteau du Missouri. The range of the Coteaus, in the country adjacent to its crossing by the Northern Pacific, is more or less thickly massed with hills, few or none of which have an elevation more than 40 feet above the general level of the contiguous uplands. Their summits and rather abrupt slopes are covered with stones and limestone and granite boulders of all sizes, caught by their prominences from the stranding bergs of the glacial period. Occasionally there are more considerable intermediate spaces of fine, clean land, well adapted for small farms, but the country occupied by the Coteaus is generally not practicable for cultivation.

The Coteaus are admirably fit for stock-grazing. The native grasses are among the most nutritious anywhere known. Fine hay meadows abound, yielding two and a half tons of choice hay to the acre. Ample natural shelter is afforded in the glens and recesses of the hills. The conditions of climate are such as to ensure perfect health among stock. In years of average weather, the choicest of summer grazing may be had from June 10th to October 15th. Cattle increase rapidly in weight feeding on the grasses of these glens. A single instance, to illustrate, may be cited of a cow which bought fat in October, then weighing 1,345 pounds, weighed when killed, five weeks later, 1,495 pounds, thus increasing 150 pounds in five weeks on these grasses. Sheep do particularly well. The effect of the climate is to make the fleeces heavier. Common sheep, yearlings, have sheared eight and a quarter pounds to the fleece! When cattle can get at the grasses in winter, they will fatten; there is abundant nutriment in the cured grasses, but the liability to severity of weather is such that cattle must be provided with winter food and shelter. Sheep, during winter, are fed chiefly on straw, with a little hay, and come out in good condition in spring. The Coteaus will eventually prove to be as rich and wealth producing as any lands on the Northern Pacific Railroad.

LOGAN COUNTY

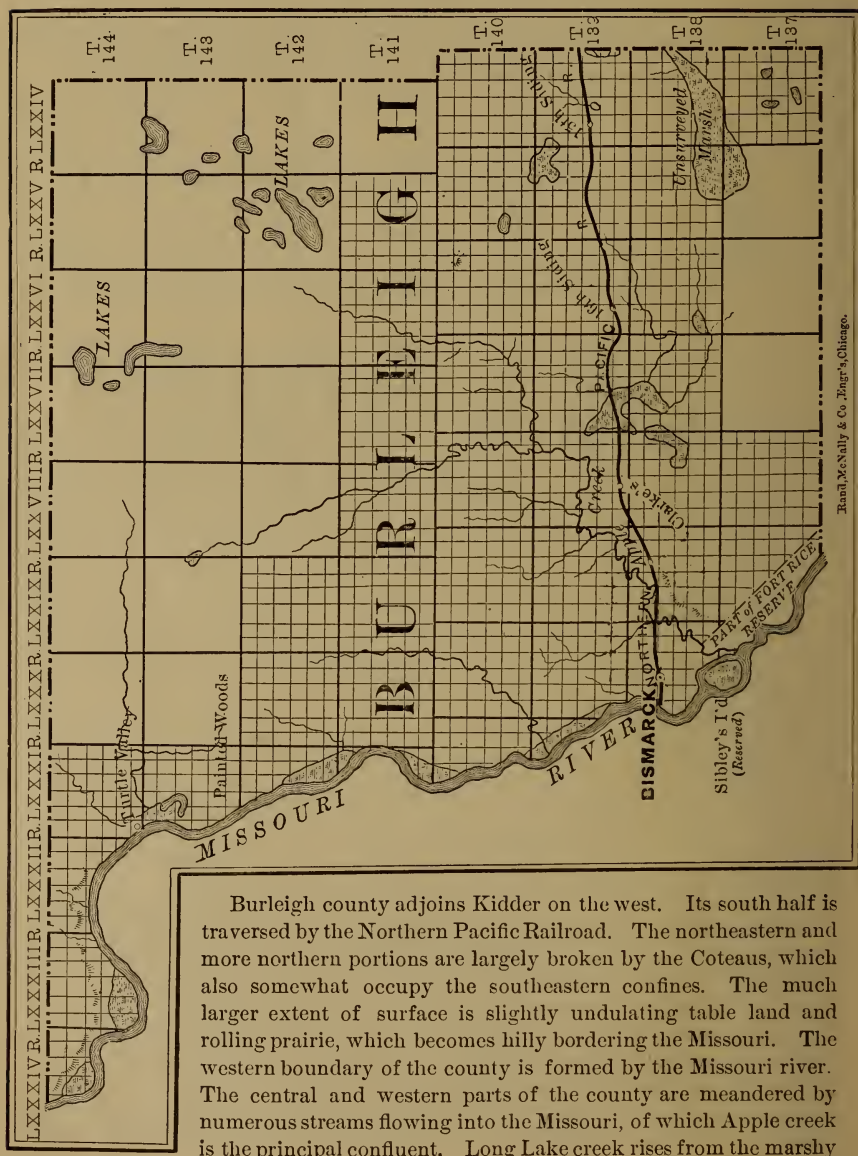
Bounds Kidder county on the south, and La Moure and Dickey counties on the west. Its surface is moderately undulating, except where thrown up into and broken by the Coteau formations, which, in the south part of the county, begin to retire into the general level of the prairie. Several tributaries of the Missouri take their rise in and cross the western townships, and a group of lakes occurs in



the middle districts. Considerable portions of Logan, like Kidder county, are finely adapted for stock. The soils of the more practicable agricultural lands of the county, occupying a large proportion of its surface are in general the same as in other sections of the Missouri plateau. The total land surface is, one township surveyed, Township 131, Range 53, 22,654 acres; balance not surveyed, estimated, 1,264,000 acres; total, 1,286,654 acres. In the tier of counties last described nearly

all the public lands surveyed are open to settlers under the Homestead and Pre-emption laws, and the railroad lands are yet undisposed of except in the townships nearest the line of the Northern Pacific. It is expected that appropriations will, this winter, be made to rapidly complete the surveys of the counties on and near the Northern Pacific.

BURLEIGH COUNTY.



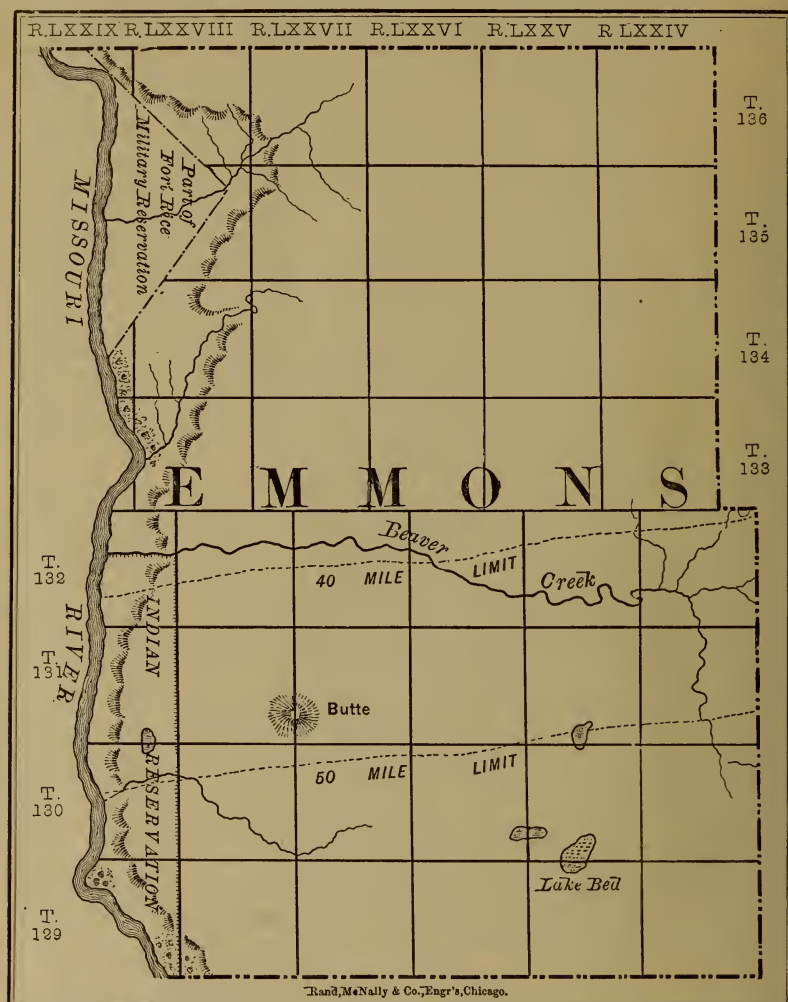
lake of that name in the southeast portion, and crosses the southern boundary. In the northern parts are numerous small streams and lakes. The width of the bottom lands on the Missouri is about three miles, on Apple and Burnt creeks nearly a half mile. The Missouri bottom is heavily timbered with cottonwood, and small groves and fringes of box-elder, oak, elm and ash occur on the interior streams. Among the hills bordering the Missouri flats and in the Coteaus are fine, natural meadows affording an abundance of wild hay. Well water of good healthful quality is obtained at an average depth over the county of from 30 to 35 feet. The northern districts of Burleigh county are excellent localities for stock grazing. The glens of the Coteaus and intermediate vales and hollows of the hilly regions are very rich in nutritious grasses, and water is abundant. The agricultural table lands and rolling prairies of Burleigh county occupy the most considerable portions of its surface, and are of varied and inviting topography, presenting many pleasing landscapes. Of these the surface soil is of varying depth, commonly from 15 to 20 inches. It is everywhere a black calcareous loam, very rich and productive. The subsoil is in some districts similar to that described in Kidder county, in others a conglomerate, adhering in strong, yellow clay.

The whole number of acres of land in Burleigh county is as follows: Townships 137 to 140 inclusive, Ranges 74 and 78; and Townships 138 to 140 inclusive, Ranges 75, 76 and 77; and Townships 137 to 142 inclusive, Ranges 79 and 80; and Townships 138 to 144 inclusive, Range 81; and Township 144, Range 82, surveyed complete, 703,599 acres; Township 141, Ranges 75, 76, 77 and 78, and Township 144, Ranges 33 and 84, surveyed, but not platted, estimated, 115,000 acres; 23 Townships not surveyed, estimated, 525,000 acres; Sibley Island, 2,400 acres; Fort Rice Reservation, 10,000 acres; total of county, 1,355,999 acres.

Though its county seat, Bismarck, has long been known as an important commercial point on the upper Missouri, the development of Burleigh as a county of agricultural production has but just fairly commenced. Many farming tracts, however, under different ownership, are now subdued, and, besides these, several large farms comprising more than a thousand acres each are established. The experience of farming in the county has well proved its excellent capacity of production. The average yield per acre, and quality of grain, is not inferior to any other section of the great northern wheat belt. The population of the county, as given by the census of 1880, was 3,246. Its resident population is now upward of 4,200, of which Bismarck contains about 2,200.

EMMONS COUNTY.

Emmons county adjoins Burleigh on the south, and Logan on the west. Its surface is generally undulating, rolling prairie and more level table land. In the townships bordering the Missouri, the country is much broken and hilly for some distance back, particularly in the south part, where the hills are prominent and bold. Emmons is one of the best watered and best timbered counties in North Dakota. Besides the Missouri, which forms its western boundary, the middle half is traversed across the entire county by both Beaver creek and Rock river, with their lesser inlets. Long Lake creek waters the northern townships, and other tributaries of the Missouri cross the southern districts. The Missouri is heavily timbered, and fine groves and belts of hard woods are on the interior streams. The soils are similar to those of the Missouri plateau as elsewhere described. The land surface of Emmons is, all estimated: public lands, 915,000 acres; Indian reserve,

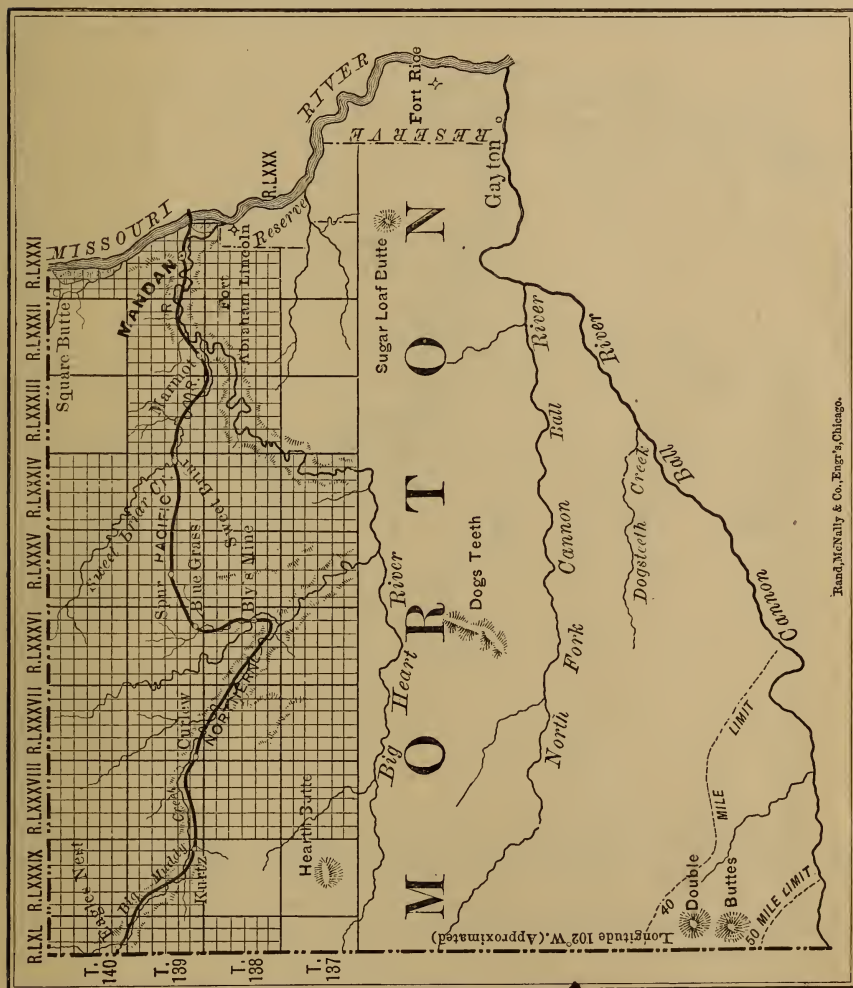


50,000 acres; military, 34,000 acres; total, 999,000 acres. But very slight cultivation has been attempted. There are settlements at Beaver creek, Gayton and Badger. Emmons is a valuable county in productive capacity, has many fine advantages, and will in the near future be more directly in the range of immigration.

MORTON AND MERCER COUNTIES.

Morton and Mercer counties are opposite Burleigh, across the Missouri. Surfaces, undulating and broken. Series of hilly ranges fortify the tortuous route of the rivers, the cleft escarpments of table land or high prairie which stretch behind them in low sweeping undulations, or in heavy and irregular billows. Again are the butte and high-mound formations, enchaind at intervals in more apparent system,

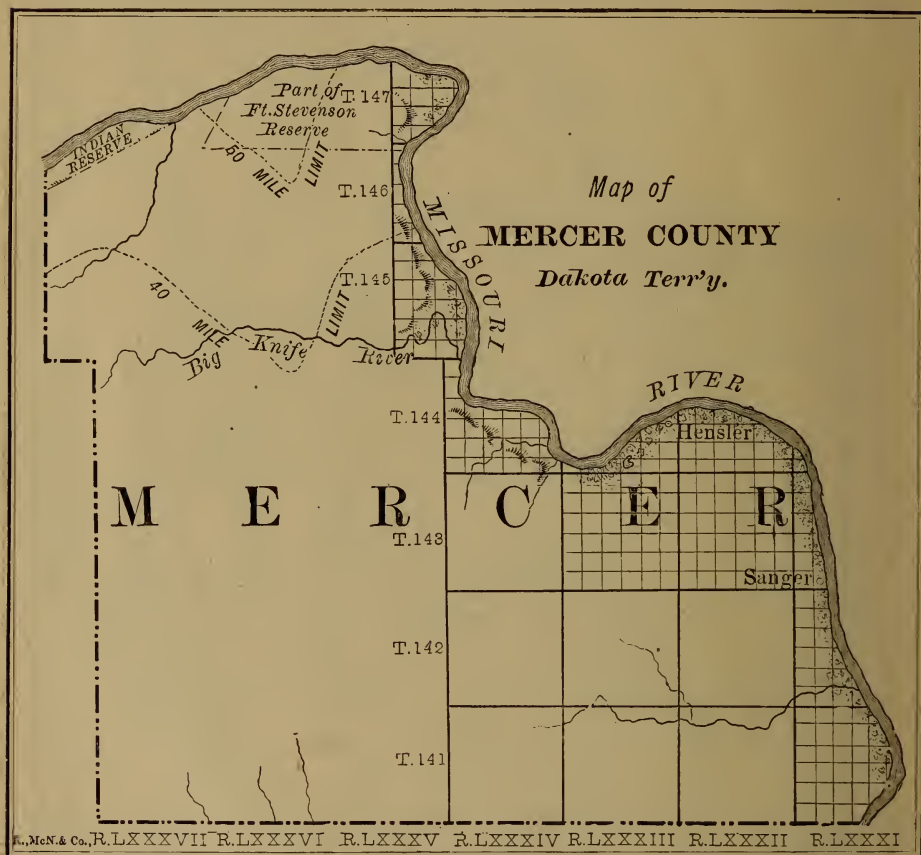
or standing alone in lofty castellated contours, or in less abrupt and smoother declivities of surface. Between these are broadly, expanding hollows, long reaches of distance, presenting many handsome faces and inclines of fine arable land. Morton county is finely watered. It is traversed irregularly east and west, through its entire extent, by the Heart river, and by the north and south forks of the Can-



non Ball river, all three of which have many tributaries which finely meander all the interlying districts. Mercer county is crossed by the Big Knife and other less important streams flowing into the Missouri. Besides the heavy timber belt of the Missouri, are fringes and groves of wood on the rivers, which course the interior parts of these counties. Inexhaustible beds of coal, near the surface and inexpensively mined, underlie Morton county. Broad meadows abound, affording abundance

of wild hay. Excellent well water is readily obtained. There is a great number of living springs in Morton county. The county generally is admirably adapted to and possesses many advantages for stock raising, an industry which is to some extent followed, and quite successfully.

The land surface of Morton county is as follows: Townships 138 and 139, Ranges 80, 82 and 83; Townships, 138, 139 and 140, of Ranges 81 and 90; Town-



ships 137 to 140 inclusive, of Ranges 84, 85, 86, 87 and 88; and Townships 139 and 140, Range 89, surveyed complete, 683,104 acres; balance of public lands, estimated, 1,197,000 acres; military reserve, estimated, 52,000 acres; total, 1,932,104 acres. The land surface of Mercer county is, public lands surveyed but not platted, 144,000 acres; not surveyed, 553,000 acres; military reserve, 26,000 acres; Indian reserve, 4,000 acres; total, 727,000 acres. Farming operations are commenced by resident settlers and owners in the vicinity of Mandan, the county seat of Morton county, and at other points. The yield and quality of the crops is fully up to the standard of the countries east of the Missouri. Notwithstanding the face of the country is so different from that of the Missouri plateau east of that river, the

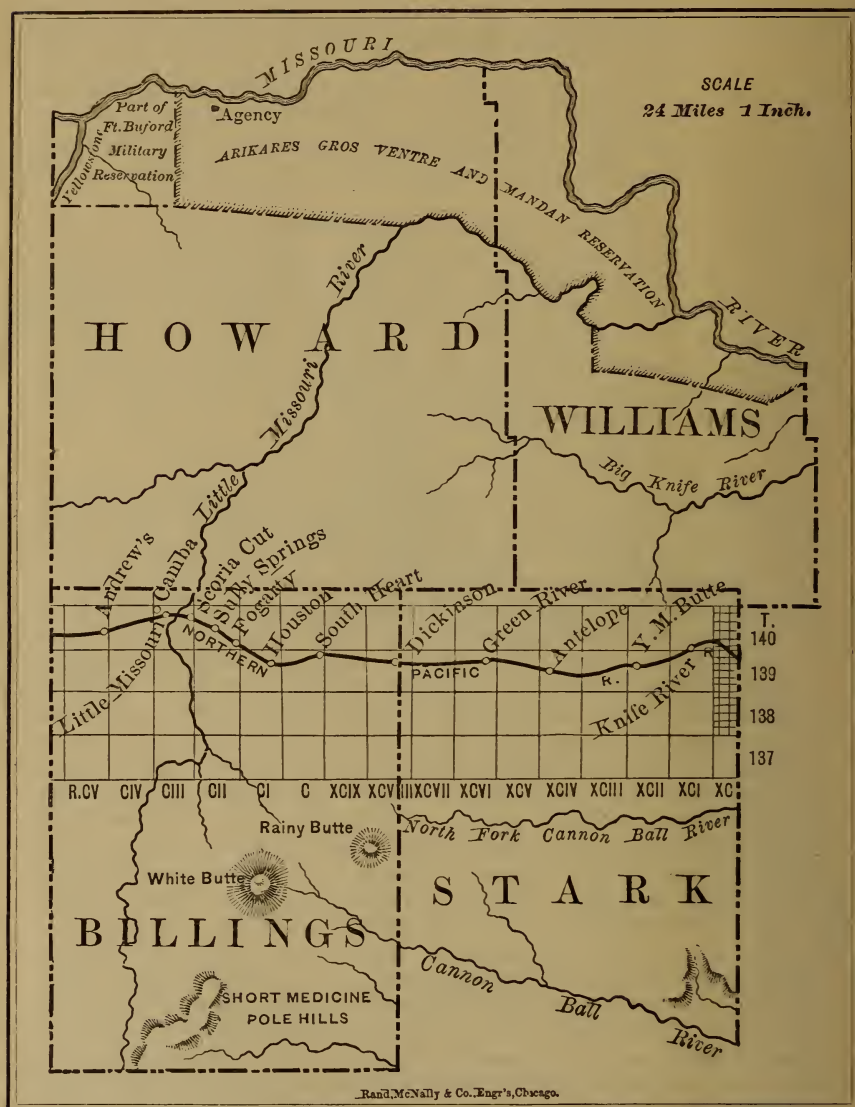
components of its soils, all included in the area of the Glacial Drift, are essentially the same, and equally capable for the perfect and enduring production of wheat and the small grains. It is true, the country being almost absolutely new, that experience has not so well proved the fact, and that no agricultural statistics for a series of years can be cited as establishing it, but so far as farming operations have progressed they unquestionably sustain it. The controlling physical facts of soil are the same, and the climate is amply adequate for the growth and maturing of the grains.

Mandan, the county seat of Morton county, situated a short distance back from the river, is already exhibiting the proofs of active business prosperity. Several permanent brick business blocks are built and being built, and a fine large brick hotel is just completed. Mandan is the initial point of trans-Missouri immigration, and the centre of a wide range of rich agricultural country which is fast being occupied and improved by an energetic class of settlers. It is also the headquarters of the Missouri Division of the Northern Pacific, which crosses the north part of Morton county. The resident population of Morton county is about 900.

STARK, WILLIAMS, BILLINGS AND HOWARD COUNTIES.

The group of counties on the Northern Pacific from Morton county west to the Montana boundary comprises Stark, Williams, Billings and Howard. The railroad passes through the northern range of townships in Stark and Billings, the counties of Williams and Howard adjoining these on the north. In these counties is found as truly handsome agricultural and grazing country as any portion of the Great West can boast. Through Morton county the Northern Pacific traverses the Heart River valley for the first 10 miles, and on its course due west leaves the Heart where it diverges in a broad bend to the south. Thence it intercepts and follows successively the valleys of tributaries of the Heart, until its near approach to the country on the Little Missouri. In Morton county occur in succession the fine valleys of the Sweet Briar, Badger, Blue Grass and Curlew, valleys of much beauty, and the fertility of which is made evident to the traveler's eye by the dense and luxuriant growth of their grasses. Crossing into Stark county the plains countries on the head waters of the Big Knife succeed, undoubtedly rich in the most fertile elements of soil, having frequent groves of timber, and numerous living springs of pure water. Thence the Northern Pacific soon crosses the Green river, where the final evidences of the Glacial Drift disappear. The Green river country is notably handsome and fertile. Next occurs Pleasant Valley on the upper Heart, scarcely to be surpassed in beauty, a very choice district for farms. At Dickinson, a station on the line in Pleasant Valley, Hon. W. S. Dickinson has broken and will this year have in crop 100 acres, the beginning of a large farm. Beyond Dickinson, through the east half of Billings county, rolls in beautiful and more regular undulations a prairie of ample and productive soil for 37 miles, when the Northern Pacific enters abruptly the curious and wonderful formations of the Bad Lands of the Little Missouri. Here is the magnificent Park of Pyramids, well described in previous extracts from Professor Denton's notes.

The surface of Stark and Williams counties is undulating and broken. The north half of Stark and south half of Williams are in general not much broken and contain a larger proportion of practicable arable land than the average of Morton county. Both counties are exceedingly well watered. The surface of Billings and Howard is broken and undulating. The butte and bluff formations are of fre-



quent occurrence, and the Bad Lands occupy considerable parts of their surfaces. There are, however, very extensive tracts of fine agricultural land in the north and east parts of Billings, and the south half of Howard. The aggregate area of the four counties is as follows: Public lands, 6,961,500 acres; Indian reserve, 1,020,000 acres; Military reserve, 110,000 acres; total, 8,091,500 acres.

BRANCH LINE COUNTIES.

The soils, climate and scope of agricultural production of the counties on the east and west lateral branches of the Northern Pacific in Minnesota and Dakota, are sufficiently indicated by the exhibits of the main line counties with which, in these respects, they closely correspond. The same is true of the countries north of Foster and Traill counties, Dakota, on the Jamestown and Casselton branches, respectively.

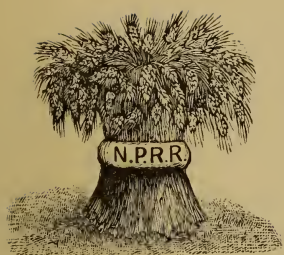
On the branch of the Northern Pacific from Brainerd to Minneapolis and St. Paul, excluding Morrison county, the statistics and map of which have been shown, are the seven counties of Benton, Stearns, Sherburne, Wright, Anoka, Hennepin and Ramsey. Of these, the larger counties of Stearns, Wright and Hennepin, lying on the west bank of the Mississippi, are quite the more important in agricultural production, and, with the exception of Ramsey county, are the most compactly settled. The surface of the territory embraced in these seven counties is more or less undulating. They are all included in the great timber belt of Minnesota, and for the larger part are wooded. In them the predominancy of the pine disappears, and gives place to the varieties of the hard woods. They are abundantly watered by the river and lake systems peculiar to the State, a combination which in a degree distinguishes the surface of Minnesota from all the other States.

The entire land area of the seven counties named is 2,586,725 acres. The whole number of farms in the territory included in their limits was, in 1881, more than 11,000. The whole number of acres under cultivation to all crops was, same year, 343,020, of which 211,477 acres were in wheat, 48,499 acres in oats, 47,866 acres in corn and 1,989 acres in barley. The joint average production for the two years last past has been, of wheat, 15 bushels to the acre; of oats, 33 bushels to the acre; of corn, 32 bushels to the acre, and of barley, 25 bushels to the acre. The whole number of farm animals in the seven counties was, in 1881, 191,712: including 29,939 horses; 71,064 cattle, of which 33,745 were milch cows; 1,209 mules; 32,428 sheep and 23,327 hogs. Of apple trees in bearing, were 46,759; growing, 120,393. The wool clip was 124,170 pounds. Nearly 2,000,000 pounds of butter were manufactured, and about 70,000 pounds of cheese.

The two leading cities northwest of Chicago and Milwaukee are Minneapolis and St. Paul. They are situated but ten miles apart. Their lengthening suburbs begin to approach each other. St. Paul, at the head of steamboat navigation on the Mississippi, was early a trading and distributing point of importance for the upper country and with Pembina. Its true commercial career may be said to have commenced at the close of the war in 1865, since when its business growth has been rapidly progressive and solid. During the year of 1881, 1,009 new residence houses were built in St. Paul, the aggregate cost of which was \$1,885,400. The number of new business houses erected was 139, costing the aggregate sum of \$2,280,300. The figures of cost indicate the superior class of improvements made. On public buildings were expended, in addition to the above, the sum of \$356,000. The jobbing and wholesale trade of St. Paul for 1881, employed 2,042 persons. The total amount of sales was \$52,218,265. The population of the city, census of 1880, was 41,473.

The growth of Minneapolis dates entirely from the close of the war, when it was small, new, and little known. Since then its progress in rank as an important manufacturing and commercial city has been remarkable. The magnificent water

power of the Falls of St. Anthony, one of the great hydraulic powers of the world, is the basis of the city's prosperity. The chief manufactured products of Minneapolis are flour and lumber. During the season of 1881 the cut of long lumber was 233,505,071 feet. In addition 86,818,500 shingles and 49,253,700 lath were manufactured. The maximum capacity of the flouring mills of Minneapolis is 25,750 barrels per day. The receipts of wheat in 1881 were 16,077,990 bushels, of which 15,412,980 bushels were ground into flour. The shipments of flour aggregated 3,143,243 barrels. Of this amount 1,278,379 barrels were exported direct to Great Britain, France, Germany, Holland, Spain, Italy, Russia and Africa. The grand total of the jobbing trade of Minneapolis, in 1881, including trade in grain, and the jobbing in flour and lumber, was \$63,036,115. The population, census of 1880, was 46,887. The present combined population of the two cities, Minneapolis and St. Paul, exceeds 110,000.



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